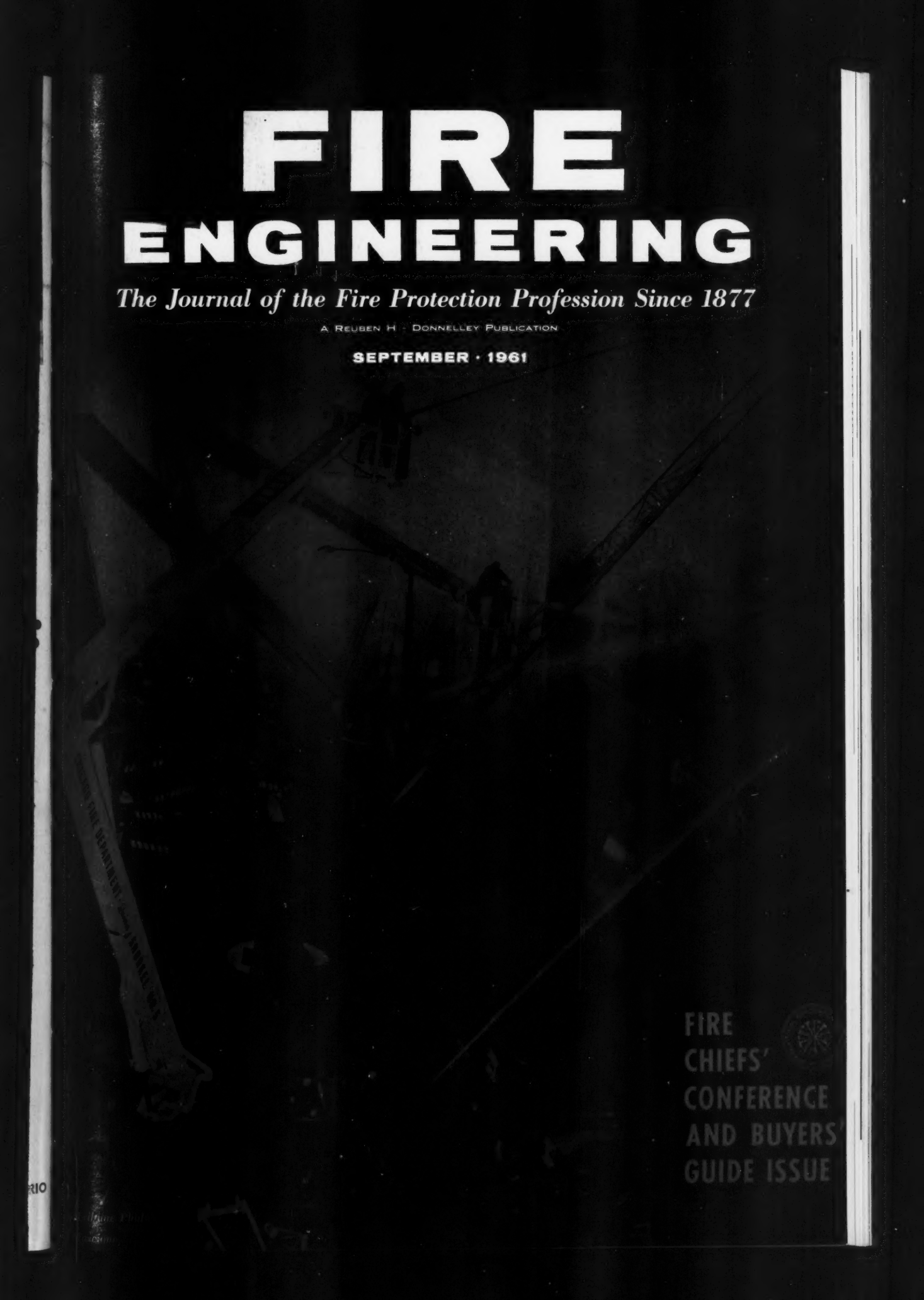
FIRE ENGINEERING

The Journal of the Fire Protection Profession Since 1877

A Reuben H. Donnelley Publication

SEPTEMBER · 1961



FIRE CHIEFS' CONFERENCE AND BUYERS' GUIDE ISSUE

*if your men aren't wearing Bullard helmets... head protection is costing you too much!

MORE FIRES FOR YOUR MONEY!

Expose rugged Bullard HARDBOILED fire helmets to searing flame (high as 2,000° F.), freeze them, soak them in boiling water... these grueling punishments won't soften or weaken a Bullard fire helmet's protective characteristics! This is the only fire hat that exceeds Federal specifications. No Fire Helmet is tougher, yet few are as comfortable to wear. Light and cool on your head... made from non-conductive fiber glass they weigh only 20 ounces. In a choice of permanent non-fading colors, these helmets are equipped with replaceable suspensions that adjust to all standard head sizes. Today, ask to see how Bullard Fire Helmets make your budget go further... help you fight more fires for the money!

Stop First Aid Water Damage

New Bullard Fire Department First Aid Kits are 100% water proof. Every supply is separately sealed in Polyethylene wrappers. Includes new approved, spray on, pain killing *After Burn Treatment*.

New Emergency Burn Treatment

No matter how severe the burn Bullard *After Burn Treatment* instantly soothes pain-reducing shock. Helps prevent infection and promotes healing. ABT is both non-toxic and non-irritating. In 3, 5, and 11 oz. spray containers.

BULLARD
INDUSTRIAL SAFETY EQUIPMENT

E. D. BULLARD COMPANY SAUSALITO, CALIFORNIA

See your local fire equipment dealer or write for catalog of complete line of fire helmet accessories.

WHAT'S NEW ?

FEDERAL Interceptor electronic Siren

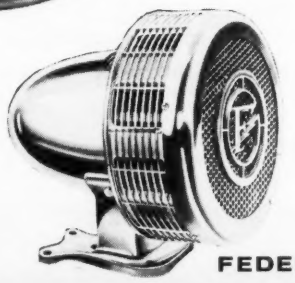
You'll *see* most of the *new things* at the I.A.F.C. Convention.

When it comes to sirens and lights there will be many new things in the FEDERAL SIGN and SIGNAL Booth #109; FEDERAL Sirens and Lights are being ***constantly*** improved.

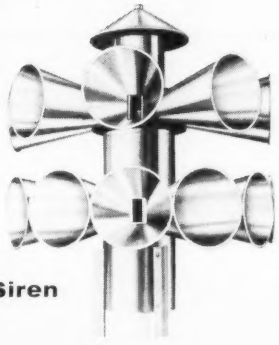
Much of the ***newness*** however, ***will not be visible,*** because in addition to new items or new external designs there are hundreds of ***invisible improvements,*** some great, some minor, that contribute to a more reliable, more valuable and more usable product.

See the finest— Visit FEDERAL at Booth #109!

FEDERAL SUPER Beacon Ray light



FEDERAL Q Siren



FEDERAL 3T22 TRIAD Siren

FEDERAL SIGNAL SIGN and Corporation

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FIRE
ENGINEERING
THE JOURNAL OF THE FIRE PROTECTION PROFESSION SINCE 1877

VOL. 114 SEPTEMBER, 1961 NO. 9

Support Civil Defense Now—*An Editorial* 741
By Donald M. O'Brien

THE CHALLENGE OF ANNEXATION

Growing Pains Challenge the Fire Service 742
A Staff Report
Meet the Fire Protection Problems of Community Growth—By Kenneth J. Carl 744
The Midwest Provides Its Share of Headaches and Solutions 746
By Donald M. O'Brien
The South Meets It Head-On 748
By Frank Hanifin
Here's How Phoenix Meets the Problem 750
By S. E. Barber
Utilizing Residences as Fire Stations 752
By R. L. Nailen
Nevada's Two Largest Fire Departments Protect Booming Resort Area—By Cliff Dektar 754
In the Far West, San Diego Feels the Pinch 756
By Roi B. Woolley

Chicago Places High Speed Fire and Rescue Boats in Service—By Neal Callahan 757
The History of Fire Department Manpower Units .. 758
By Clarence E. Meek
Single-Stage or Two-Stage Centrifugal Pumps 760
By R. B. Sargent
Properties of Fire Hose Jackets—By William H. Jamieson 762
Beware Electrical Hazards—By Chief James M. Callaway 764
Modern Badges Combine Latest Manufacturing Techniques With Age-Old Heraldry 766
Current Fire Station Designs Include Many Multi-Purpose Structures 768
District of Columbia Fire Department Operates New Training Center—By Chief Millard H. Sutton 770
Safeguarding Schools From Fire 772
By Paul C. Ditzel
New Jersey Town Installs "Silent Alarm System" .. 779
Fighting Supermarket Fires—By Chief Emanuel Fried ... 780
Four Tips to Make Your Ambulance Service Safer and More Effective 782
Smoke Jumpers—Without Parachutes! 784
By Raymond Zeleski
Trends in Naval Crash Fire Fighting Techniques ... 788
By Carl F. Dreesen
Oklahoma State U. Revises Fire Protection Curriculum—By Roger K. Sweet 789
IAFC Conference Personalities 790
Exhibitors at IAFC Conference 806
Connecticut Fire Threatens Town's Business Center . 844
By Lieutenant Ray Jones

DEPARTMENTS

Manufacturer's News 809
False Alarms 810
Among The Buffs—By Paul C. Ditzel 815
Association News 822
Names In The News 829
Fire Colleges 848
Annual Reports 858
The Round Table 864
Coming Events 869
What's Burning 870
Where to Buy—1961 Equipment Directory 793

Where to Buy—1960 Equipment Directory 793

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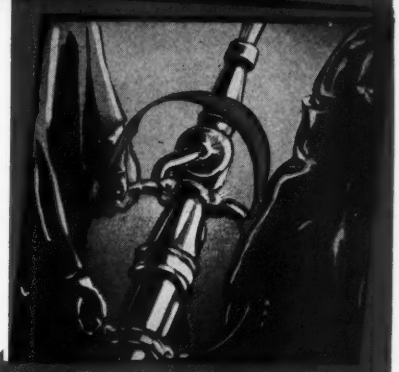


ZERO TURNS

ZERO WARP

ZERO RISE

WITH WEATHERMATE PROTECTION AND PRES-R-LOCK COUPLINGS

WRITE US OR CONTACT YOUR AUTHORIZED FABRIC FIRE HOSE REPRESENTATIVE

FABRIC FIRE HOSE COMPANY ★ SANDY HOOK, CONN.

Exclusive Manufacturers of Fire Hose Since 1869 ★ ★ ★ ★ ★

IN CANADA *Pierre Thibault* CANADA, LTD., LTEE., PIERREVILLE, QUEBEC

MAXIM MOTOR COMPANY

Avoid Verbal Orders

Date July 26, 1961

To: Ben W. Lewis, Sales Manager

From: J. C. Whitcomb, President

Subject: I.A.F.C. Convention - 1961

At Las Vegas, we will see many of our old friends, customers, and dealers. (Booth No. 41)

One of the subjects that will, inevitably, come up will be our policy with regard to MAXIM Apparatus in these difficult times.

Our policy continues exactly as it has for generations --

1. To Custom Build Each Job.
2. Uncompromising Craftsmanship.
3. Rugged Design for Long Service Life.

Thus, we can hope to merit the continued confidence of our friends, old and new, in our full line of MAXIM Pumpers and Aerials.

Signed J. C. Whitcomb

FIRE KING was the first fire hose with Dacron filler cords. Its amazing strength, light weight, ease of handling have made it a favorite with firemen everywhere.

FIRE KING BOOSTER HOSE. Extra strong, premium quality. Designed for higher pressures (1000 pounds) on the newest type trucks. Light, compact, extremely flexible.

FLEXSEAL is strong but light, easy handling. Protected against mildew and rotting by exclusive BFG Superseal treatment.

DIAMOND FIRE HOSE is so flexible you can tie it in knots. All-Dacron jacket outwears all others, is never weakened by mildew.

Good hose pays off when the pressure's on

All the money saved on "bargain" hose—and much more—can go up in smoke in the extra seconds it takes to get heavy, bulky hose into action or to replace a blown out section. The quality features in a B.F.Goodrich hose that prevent these delays add only a few cents per foot to its cost, but are worth much more when the pressure's on. And in the long run, BFG hose pays back the extra pennies it costs by lasting months, even years, longer than ordinary hose.

If you're looking for a good buy in fire hose, see a B.F.Goodrich distributor. He can tell you more about the four best-sellers shown on this page, and bring you up to date on the new features in the complete BFG line. *B.F.Goodrich Industrial Products Co., Dept. M-159, Akron 18, O.*

B.F.Goodrich

FIRE HOSE

ARE YOU THINKING AHEAD ON FIRE APPARATUS POWERPLANTS?

Perhaps you are one of the progressive fire officials throughout the country who are showing a strong interest in new types of apparatus powerplants. Today's ever increasing protection and budgetary problems may be causing you to look for even better apparatus performance, dependability, and operating economy. If so, you should:

CONSIDER THE ADVANTAGES OF DIESEL-POWERED APPARATUS

Diesel power is the only new power for fire apparatus proved by millions upon millions of miles of actual truck service. Diesel engines provide excellent road and pumping performance because they reach peak h.p. at lower engine speeds than gasoline engines and they excel even the finest gasoline powerplants in dependability and long life. Moreover, they can run 35% longer on each tankful of fuel and idle for hours with no harm to engine.

Equally important, they can cut operating costs as much as fifty percent. Basically more efficient, they provide substantially greater fuel mileage than the best of gasoline engines, using cheaper fuel. And they greatly reduce maintenance costs because they are far more trouble-free. Of all automotive diesel engines built in this country today, the record shows that the leader in performance, economy and dependability is the . . .

MACK THERMODYNE® DIESEL

WHAT ARE THE ADVANTAGES OF THE MACK THERMODYNE® DIESEL?

1 **Maximum performance at operating and pumping speeds.** Develops 230 HP at 2300 rpm and 583 lb.-ft. of torque at 1600 rpm. Turbocharged for peak efficiency.

2 **Minimum fuel consumption.** The inherent efficiency of diesel power gives the advantage of being able to pump 35% longer on a tankful of fuel. Reduces need to refuel during long pumping assignments, eliminates danger of handling highly flammable gasoline, and also eliminates danger of carbon monoxide fumes. Diesel fuel is considerably cheaper than gasoline and contains more BTU's.

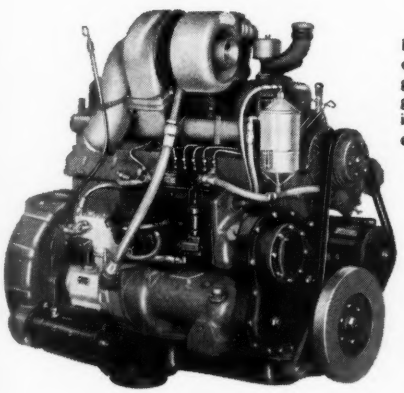
3 **Maximum power at altitude.** No power loss at all up to 6000 feet above sea level with the Mack Turbocharged diesel and only a 2% loss per 1000 feet above 6000. With gasoline power the loss is 3% per 1000 feet right from sea level on up.

4 **Maximum dependability 4-cycle, 6-cylinder design.** Cooler-running. No spark plugs to foul. No ignition systems to short out. The most dependable engine ever made by Mack—the standard of dependability.

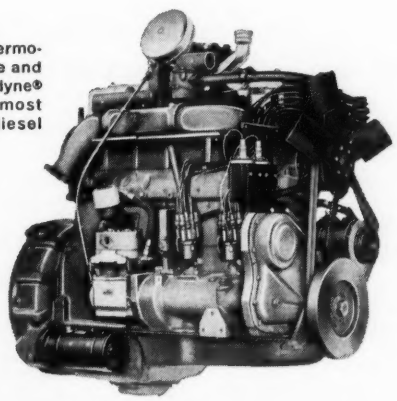
5 **Minimum maintenance.** Mileages of 300,000, 400,000—even 700,000 miles in truck service—before engine overhaul means thousands of engine hours in fire service. Will not foul up during long periods of idling. Built with typical Mack strength and servicing ease. Similarity to Mack Thermodyne® gasoline engines simplifies mechanics' training—over 350 Mack service centers expedite servicing and parts supply.

The famous Thermodyne® diesel engine is made by Mack. It is part of the exclusive Mack concept of Balanced Design . . . by which all major components are Mack-built to the highest standards of the industry . . . to work together to a degree of efficiency unmatched by apparatus assembled with purchased components. We build them —we stand behind them 100%. Who else can say the same? Mack Fire Apparatus, Allentown, Pennsylvania. Mack Trucks of Canada, Ltd., Toronto, Ontario.

8487



Note similarity of Mack-built Thermodyne® diesel and gas engines! Size and general appearance of Thermodyne® gasoline engine (right) are almost identical with Thermodyne® diesel engine (left).



MACK FIRST NAME FOR FIRE APPARATUS

COMPLETE LINE OF PUMPERS . . . 500 TO 1250 GPM . . . SQUAD AND HOSE WAGONS . . . AERIALS 65' TO 146' . . . COMBINATION LADDER TRUCKS

A quarter of an inch from danger

. . . but new flexible steel insole keeps feet safe in B.F.Goodrich and Hood Firefighter boot

THAT sharp spike can't stab through the sole of *these* boots. Your feet are protected by overlapping steel plates buried in the flexible safety insole. New B.F.Goodrich and Hood *Firefighter* boots are also reinforced with an extra heavy toe cap, and have a non-slip sole that prevents nasty spills when it's slippery under foot. Both toe and sole are a brilliant white color for greater visibility.

Attention to small details in the construction of these *Firefighter* boots also makes a big difference in extra wear, comfort. To make boots last longer, there's an extra layer of rubber where boots ordinarily chafe. The inside knee band which receives the most flexing is made of neoprene, a special rubber that resists cracking. Straps and buckles are fully coated with rubber and securely anchored into body of the boot. Interior of boot is lined with soft felt to keep legs and feet warm. Outsole shank is especially designed to make feet more comfortable on ladders. And the leg is made extra wide so boot is easier to get on and off.

B.F.Goodrich and Hood *Firefighter* boots with the new flexible safety steel insole come in sizes 5-13, in short and Storm King height. For more information, call your BFG or Hood distributor; or contact *The B.F.Goodrich Company or Hood Company, Dept. F, Watertown 72, Mass.*

FIREMEN'S BOOTS BY B.F.Goodrich and Hood

APPARATUS BY HAHN

750 GPM Pumper with Single Stage Hale Pump

CUSTOM BUILT bodies on commercial chassis. Outstanding quality at moderate cost. Bodies engineered to your individual requirements on rugged commercial chassis.

STANDARD immediate delivery on standard pumpers—We will be glad to demonstrate our new custom cab forward model "c."

PUMPERS—750—1000—1250 GPM AERIALS—55—65—75—85 FT.

R. HEINEY—Chief Engineer J. PARTRIDGE—Sls. Mgr.

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CUSTOM BUILT **HAHN** STANDARD MODELS

MOTORS, INC.

HAMBURG, PA.

HOSE JACKETED 1

D 100% WITH DACRON®

POLYESTER FIBER

Needs No Drying... Can Be Put Away Wet!

Repack Wet. Hose jacketed 100% with "Dacron"* polyester fiber can be put away wet, because it's unaffected by moisture and mildew. Just wash it down after use, pack it on the truck, and you're ready to go again! It's never out of action on drying towers—so you can operate with less hose!

It's Tough. You can drag it through rubble—stomp on it—splash it with chemicals—soak it in water. This hose will *take it* and come back for more. In one test, hose jacketed 100% with "Dacron" was ready for immediate action after being dragged 8 miles on asphalt at 10 mph. A cotton hose was unusable after the same treatment for only 3 miles. So you can see how hose jacketed 100% with "Dacron" will cut your replacement costs to the core.

Ask your supplier for more information, or write: E. I. du Pont de Nemours & Co. (Inc.), Textile Fibers Dept., D. M. 16621, 3rd & Greenhill Avenues, Wilmington 98, Delaware.

*Du Pont's registered trademark for its polyester fiber.

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Better Things for Better Living
. . . through Chemistry

"BIG CITY" Protection on a SMALL Budget!

55, 65, 75 AND 85 FOOT LENGTHS

GROVE *Hydraulic* AERIAL LADDERS

Now, your community . . . large or small . . . anywhere . . . can have an aerial TO FIT YOUR SPECIFIC NEEDS! Your favorite fire truck builder will supply these modern, safe, Grove Aerials that can be incorporated with pumper apparatus or regular ladder trucks with proper compliment ground ladders.

AVAILABLE FROM YOUR FAVORITE FIRE TRUCK BUILDER

YOU'LL LIKE THESE GROVE FEATURES . . .

- All steel ladders or steel baseladder with aluminum mid and fly sections.
- Dual outboard hydraulic elevating cylinders.
- Dual extension and retraction controls for unprecedented safety.
- Positive manual ladder locks.
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- Safe, comfortable height, lighted operator's pedestal.
- Full range of ladder accessories.
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- Can be mounted on most conventional and forward control custom or commercial truck chassis.

HYDRAULIC OUTRIGGERS

Outriggers may be extended or retracted independently and used at any position through fully extended. Vertical and horizontal positioning are hydraulically controlled.

Special HYDRAULIC WINCH

A hydraulic operated winch can be mounted in the base section for use in rescue work off the edge of an embankment, bridge, or into wells or holes. A cable runs from the winch through a snatch block anchored to the top rung of the No. 3 section thence down. A heavy snap hook on the end of the cable can be attached to a device for lifting the maximum ladder capacity in any given position.

WRITE TODAY FOR DETAILS AND A GROVE DEMONSTRATION

Typical GROVE installation on a HOWE Model HRA AERIAL TRUCK

GROVE MFG. CO.
SHADY GROVE PA.

The facts about transistorized 2-way radio

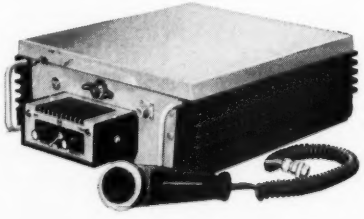
(FROM THE LEADER IN RADIO—RCA)

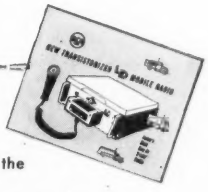
If you're cautious about specifying transistorized 2-way radio for your business . . . if you don't have full facts on the newest developments in radio communications equipment . . . you'll want to read this "Best Seller" by RCA. It's a fact-filled booklet that delves inside the "LD" (Low battery Drain) Mobile Radio; shows you why the "LD" gives you all the advantages of transistorization at a price comparable to all-tube equipment. Transistorized—yet easily serviced. Miserly in power consumption—yet generous in performance.

Check These Important Sections:

- How 2-Way Radio Finds "Hidden" Profits
- Inside Story on the "LD"
- Why Transistors?
- Nationwide Servicing

Read all about 2-way radio. You'll see why the new "LD" is today's best buy! Send coupon for your copy of this informative booklet.





RADIO CORPORATION OF AMERICA
Telecommunication Center, Dept. Z-50
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☐ Please send me FREE BOOKLET on the new "LD" Mobile Radio.

☐ Have RCA Communications Specialist contact me to discuss today's best value in 2-way radio.

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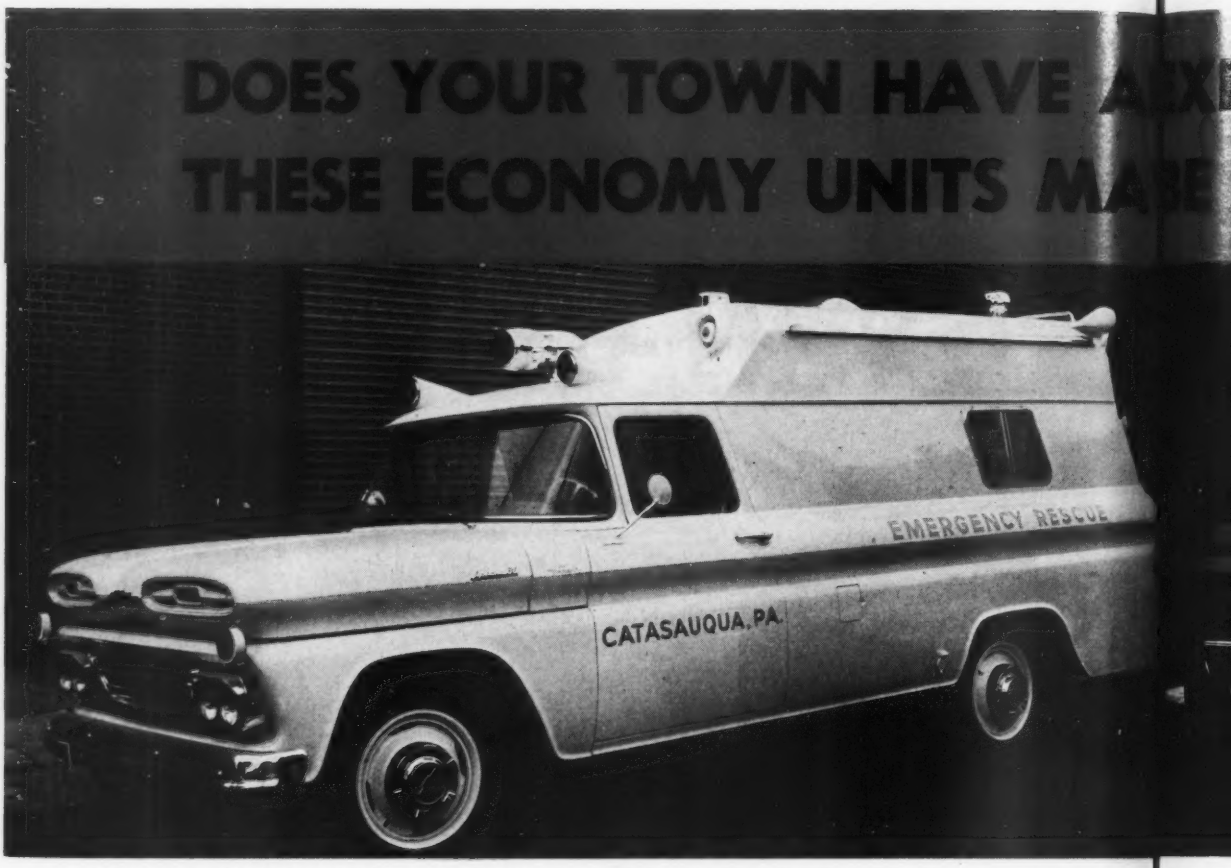
COMPANY OR ORG._____

ADDRESS_____ PHONE_____

CITY_____ COUNTY_____ ZONE___ STATE_____

The Most Trusted Name in Radio
RADIO CORPORATION OF AMERICA



PLAN WHAT YOU WANT AND GET IT WITH A— CHRISTOPHE

CAN YOU AFFORD $30,000 TO $40,000 PER UNIT TO COVER NEWLY EXPANDED AREAS? IF YOU CAN'T WHY NOT CONSIDER A CHRISTOPHER COMBINATION THAT WILL NOT ONLY GIVE YOU PROTECTION, BUT PROTECTION AT A LOT LESS COST—A PUMPER PLUS RESCUE.

RESCUE SQUADS—fast growing—fast moving—demanding the best of rescue equipment in their benevolent business of saving life, look to CHRISTOPHER.

These CHRISTOPHER COMBINATIONS are for you! They match the tempo—the speed of Rescue Squads. Their basic design is engineered with you in mind. There are 20 compartments for all manner of rescue equipment. They carry 12 men as well as stretcher patients. Greater headroom and full rear door opening. Rear opening model has 5-man fully enclosed cab. Our engineers follow your suggestions and furnish blueprints for your complete satisfaction. Equipment can include flood lights, oxy-acetylene torch, resuscitators, oxygen equipment, generator (5KW), portable pump, 2-way radio, loud-speaker, hydraulic rescue kit (20 ton), cable reels, gas masks, line throwing gun, gasoline chain saws, salvage covers, extinguishers and full complement of tools, ropes, hose, winch, etc. Built for true ambulance comfort with rescue truck ruggedness. Top quality.

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Gordon Heights, New York; Cornwells Heights, Pa.; Conshohocken, Pa.; Lansdowne, Pa.; Oakmont, Pa.; Export Pa.; Sunbury, Pa.; Manassas, Va.; West Bend, Wis.; Lincoln Park, Mich.; Ossining, New York; Albuquerque, N. M.; Denver, Colo.; Englewood, N. J.; Jersey City, N. J.; Ethiopian Imperial High Command, Addis Ababa, Ethiopia; Petrobras, Bahia, Brazil; Petroquimica, Caracas, Venezuela; The Army—Caracas, Venezuela; Baton Rouge, La.; Weirton, W. Va.; Fairfield, Conn.; Catasauqua, Pa.; City of Hollywood, Fla.; etc.

*You're ready for any emergency with—*CHRISTOPHER

EXPANSION PROBLEM?
ABE YOUR BEST ANSWER!

COMBINATION*

(IT MAY BE POSSIBLE TO GET UP TO 50% MATCHING FUNDS WHERE UNITS MEET CIVIL DEFENSE REQUIREMENTS)

FIRE COMPANIES that can use the world's most versatile apparatus will find in CHRISTOPHER COMBINATIONS the answer to long-felt needs of the fire service. Every unit is designed and built to your own company's specific requirements—blueprinted and completely laid out for your approval before the job is started. Any chassis you choose, any pump you choose, stainless steel foam tank with proportioner discharging 6,000 gals. foam compound, 200 feet of 1½" hose, two 8 foot lengths of hard suction, booster reels with 250 feet of ¾" high pressure hose, discharging both sides thru 2½" x 1½" lines. Rear booster for use with 200 gal. water tank or for hydrant or drafting from ponds. Compartments for all type of Rescue equipment. (See Equipment Listed on Opposite Page)

Let us send you photos and further information on the CHRISTOPHER COMBINATION—the world's most versatile, hard hitting fire truck and rescue car.

* All units covered by international patents issued and pending.

FINANCING ON LEASE OR PURCHASE PLAN ARRANGED
USE THE COUPON (Salesman will NOT call)

DREAM UP YOUR CHOICE!

You can have AMBULANCE—SQUAD CAR—RESCUE CAR —RESCUE plus PUMPER—you have many units individually or in any combination. AMBULANCE also available on passenger car chassis.

PRODUCTION LIMITED—PLEASE ACT NOW!

THE CHRISTOPHER COMPANY
Div. of International Auto-Industries Corp.
1095 Madison Ave., New York 28, N. Y.

Please send me complete low-down on the CHRISTOPHER COMBINATIONS for Rescue Squads ☐
for Fire Depts. ☐

Name & Title .....
Squad or Company .....
Mail Address .....

COMBINATIONS

"The Greatest Name in Fire Apparatus"

Nationwide Distribution

Seagrave

CEMCO

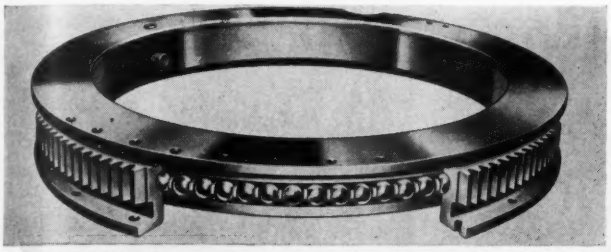
EAGLE

- High tensile steel extruded tapered booms for greater strength.
- 65 feet and 85 feet units measured from ground level to bottom of platform.
- 100% hydraulic operation.
- Booms can be raised to full height and rotated 360° in 60 seconds. Continuous rotation.
- Engineered for installation on Seagrave custom chassis or suitable commercial chassis.
- Sold, serviced, and guaranteed by Seagrave on nationwide basis.

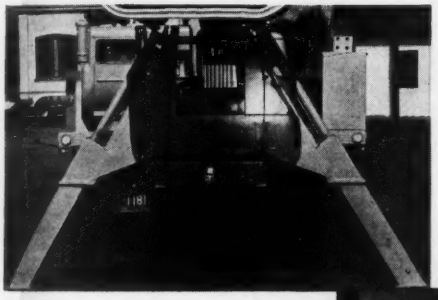
THE SEAGRAVE CORPORATION
Columbus 7, Ohio

King-Seagrave, Ltd.
Woodstock, Ont.

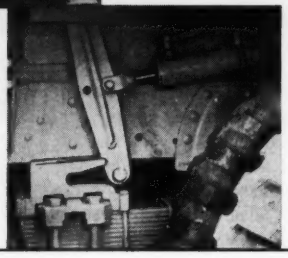
Announces the Exclusive of the Top Quality Aerial Platform!



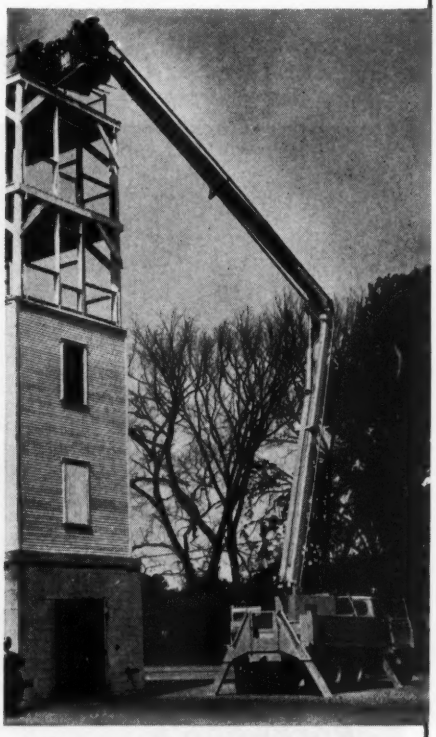
MONO-RACE BALL BEARING TURNTABLE. Balls interlock two races together. Turntable cannot tilt, lift off or shift sideways. Sealed top and bottom to keep out foreign matter.



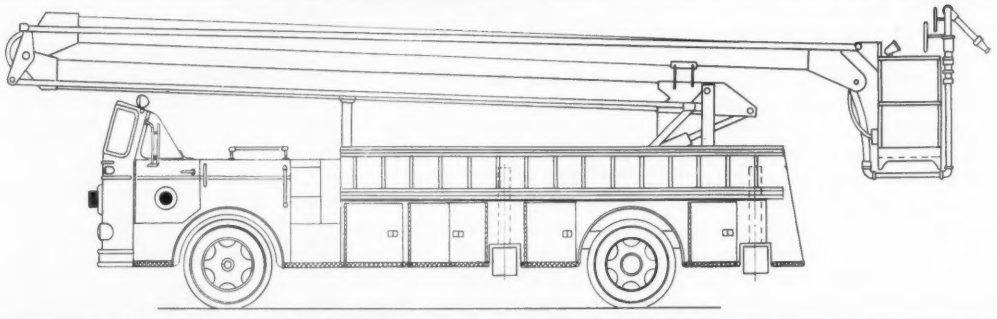
SELF-LOCKING OUTRIGGERS stabilize truck and keep it in level position.



SPRING LOCKOUTS prevent axle springs from flexing during platform operation.



Demonstration of Seagrave-Cemco Eagle for rescue operations. Extended height measured from ground level to bottom of platform making it several feet higher than competitor's platform.



Engineering drawing showing Seagrave-Cemco Aerial Platform in "bed" position on Seagrave custom chassis.

MAIL THIS COUPON

THE SEAGRAVE CORPORATION **COLUMBUS 7, OHIO**

Please send complete information on the following:

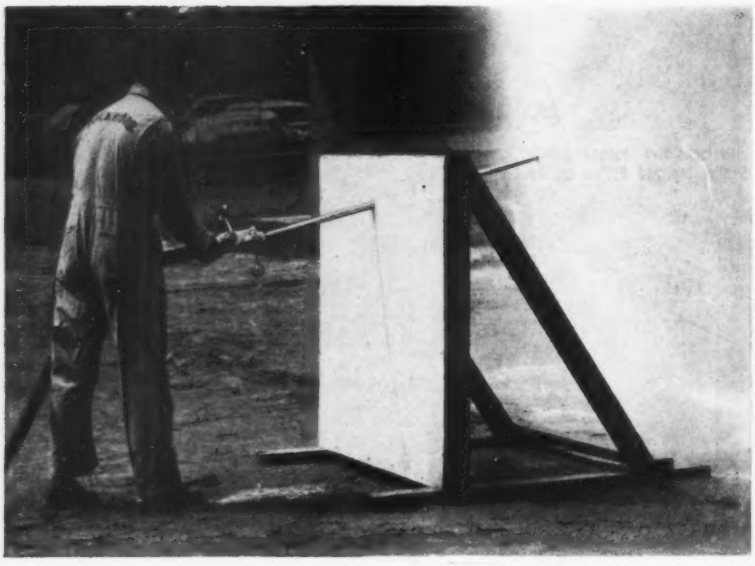
☐ AERIAL PLATFORMS ☐ PUMPERS ☐ AERIALS ☐ CAB FORWARD ☐ CONVENTIONAL ____ OTHER
(Fill in this space for special information)

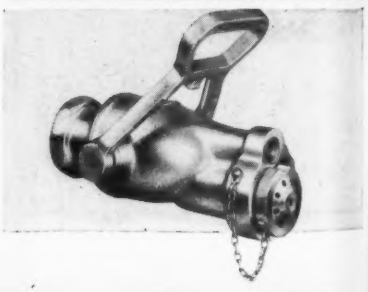
NAME _____ TITLE _____

ADDRESS _____

FE 9-61

Adapts to all types of fires... IN SECONDS!





Rockwood's Six-way WaterFOG Nozzle

It's a firefighter's indispensable ally! That's the Rockwood All-purpose Type SG-60 WaterFOG Nozzle, the nozzle that puts out fires faster because it can convert to six separate discharge patterns right on the fire hose line. *And without loss of time!*

The SG-60 is a true all-purpose nozzle permitting water application in any of the accepted discharge patterns plus solid stream FOAM and FogFOAM, the speediest and most economical ways of applying foam. Thanks to its versatility the SG-60 can be used to fight all types of fires including wood, paper and cloth, flammable liquids and electrical. And regardless of the applications you use, your fire department saves money because *the SG-60 does the work of six nozzles, eliminates the need for "special" or single purpose nozzles.*

The SG-60 nozzle body and valve handle are made of lightweight, durable aluminum alloy with high polished finish. Valve consists of a hard chromium plated ball rotating against a synthetic rubber seat. All other parts are bronze, brass and stainless steel. The SG-60's three-position valve handle permits easy adjustment to fire-fighting conditions and the few attachments needed for special types of fire fighting can be adapted in a matter of seconds. For further information write Rockwood Sprinkler Company, Portable Fire Protection Department, 443 Harlow Street, Worcester 5, Massachusetts. A Division of The Gamewell Company, A Subsidiary of E. W. Bliss Company. Distributors in all principal cities.

Rockwood engineers water . . . to cut fire losses.

ROCKWOOD

PORTABLE FIREFIGHTING EQUIPMENT

CONGRATULATIONS

IAFC

The International Association of Fire Chiefs is to be commended for the splendid work it is doing toward the advancement of the Fire Service.

The Bi-Lateral Fire Hose Company says:

"Every Fire Chief should be a member of IAFC"

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B & W Fire Equipment Company
2735 W. 9th

Connecticut, Westport
Orville A. Sawyer Co.
Robt. F. Fosdick, Mgr.
P. O. Box 544

Florida, Jacksonville
W. Q. Dowling, Jr.
P. O. Box 6338

Illinois, Barrington
Great Lakes Fire Equip. Co.
M. Dalton—E. Simek
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Indiana, Indianapolis
Midwest Fire & Safety Equip. Co., Inc.
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1018 Grandview Ave.

Texas, Dallas
Jno. T. Hanway
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114 Merlham Drive

BI-LATERAL'S DISTRIBUTORS AND DEALERS throughout the country join the Bi-Lateral Fire Hose Company in their full co-operation with INTERNATIONAL at all times.

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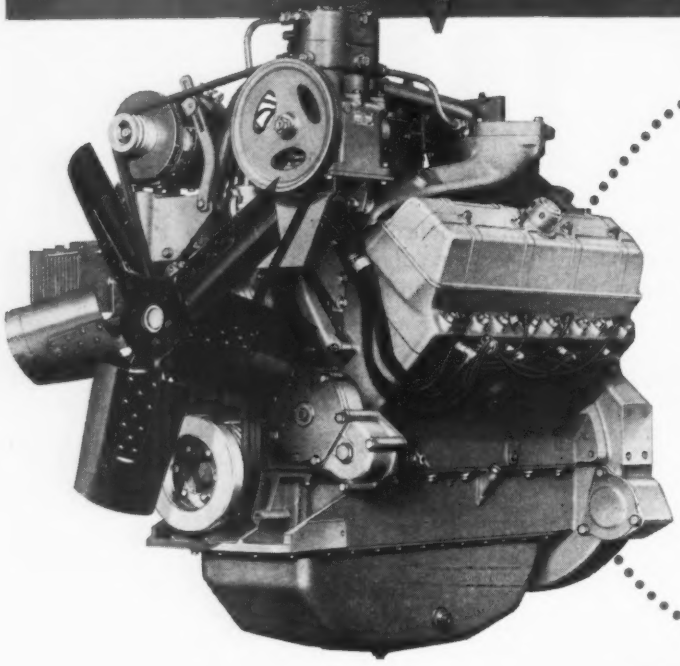
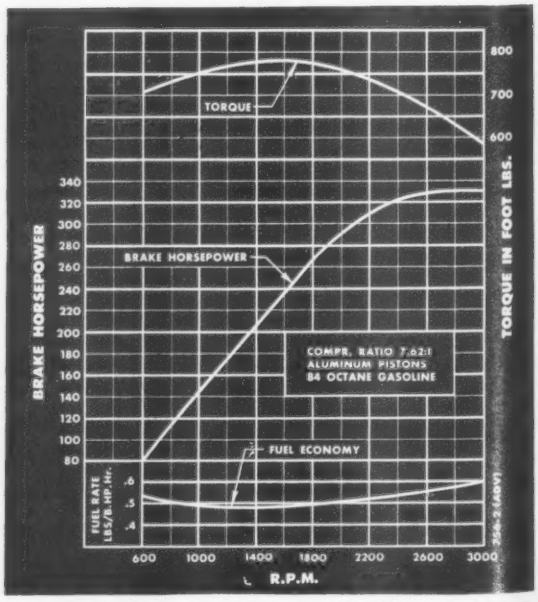
ROILINE V8 for FIRE FIGHTING



Model H884

ADVANCED V-8 DESIGN
330 MAXIMUM HP.
884 CU. IN. DISPL.
DUAL IGNITION AVAILABLE
QUICK ACCELERATION
GOOD FUEL ECONOMY
LOW MAINTENANCE COST

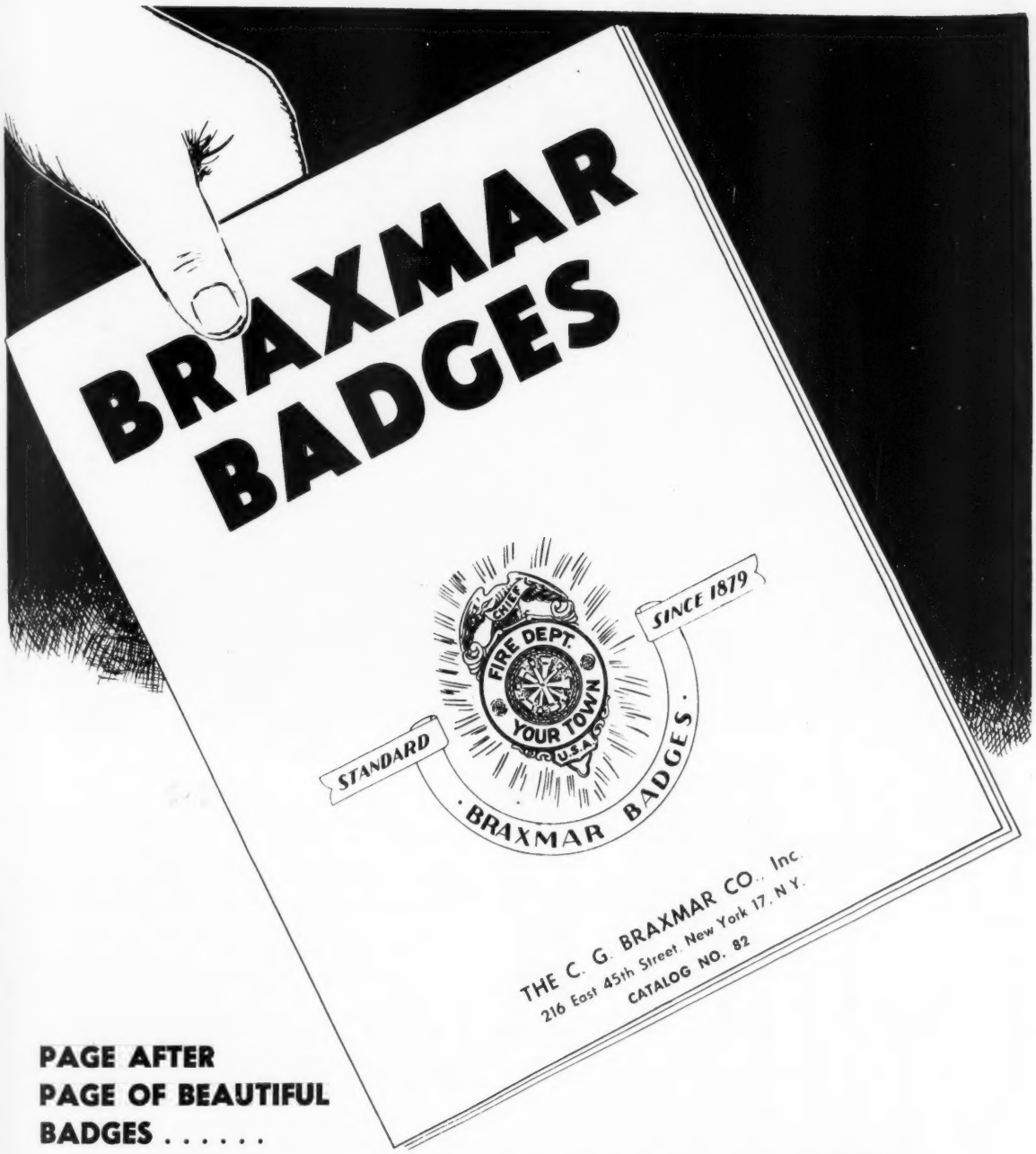
The ROILINE H884 is a compact, high compression, overhead valve engine with the added advantages of extra speed and power. This flexible V-8 power package is designed for the instantaneous response and quick acceleration necessary to fire fighting equipment. The short stroke design of this engine means slower piston speeds, with a consequent reduction in engine friction, even at high engine speeds. The box-like construction of the crankcase adds extra rigidity and bearing support to the crankshaft. The sturdy forged-steel crankshaft is short, due to V-8 compactness, with large diameter, wide surface bearing areas. The result is smooth operation with the least amount of vibration. Water cooled exhaust manifolds are standard on all H884 models. The combination of V-8 design, sturdy, compact construction, and quick acceleration makes the ROILINE H884 engine a top performer for fire equipment power.



Performance of H884 engine without accessories. Continuous full load should not exceed 80%; intermittent, 90% of hp shown. Ratings conform to I.C.E.I. standards. Governors set for 2850 rpm idle and 2600 rpm full load. Consult Waukesha Motor Company for speeds for your service.

468

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
New York • Tulsa • Los Angeles / **Factories: Waukesha, Wisconsin and Clinton, Iowa**



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it contains many of the old stand-by and many modern designs—all in all a wonderful collection of the finest badges we have made in our over 82 years of service. You'll find hundreds of designs to choose from—in nickel, rhodium, sterling silver, gold plate, perma-glo, gold filled, 10 kt. and 14 kt. gold. Completely new designs developed upon request. As one of America's oldest badge manufacturers we can assure you complete satisfaction and service.

AND ITS YOURS FOR THE ASKING . . .

. . . every fire company . . . every fire equipment dealer should have this newest catalog . . . please write for it on company letterhead, or attach your card to coupon below.

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216 EAST 45th ST., NEW YORK 17, N. Y.

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POSITION.....
STREET.....
TOWN.....

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Firefighters in over 200 American communities have found that Boardman builds the pumper that suits their needs *best* . . . because Boardman builds to exact specifications! Boardman pumpers have the features and equipment you need, mounted on the standard chassis of your choice, for quick local service. Your choice of pumps—the Waterous 500 GPM one-, two- or three-stage or the Waterous 750 GPM two- and three-stage—assures the right capacity for your city's needs. And though your pumper will be custom-designed, you'll pay far less than a "custom-built price" at Boardman!

Let Boardman answer your city's fire alarm with the illustrated brochure, *Boardman Fire Fighters,* describing every pumper and tanker in their line. If your need is urgent, place a collect call for immediate details.

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Gold Crown
MUNICIPAL FIRE HOSE

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- excellent protection against dragging, banging, any cause of abrasion
- mildew-proof with high resistance to acids, alkalies, other deteriorating chemicals

SUPERIOR EXTRUDED TUBE

Available with Neoprene, rubber or high ozone resistant tube.

ALL-DACRON* DOUBLE JACKET FOR EXTRA DEPENDABILITY

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Always easy to spot by day or night: on the rack, on the street, or in use anywhere. Another safety "plus" from Boston!

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Don't just spend your hose dollars, invest them! Specify Boston Gold Crown Municipal Fire Hose.

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PITMAN SNORKELS

have scored many firsts...

First in operational experience. Bedford Park, Illinois, 50-foot Pitman Snorkel fighting 1,000,000 gallon tank farm fire. The Snorkel played a major part in keeping other tanks cool, prevented their exploding.

Steger, Illinois, 50-foot Pitman Snorkel fighting a 3-story hotel fire in the downtown business district of Chicago Heights, Illinois.

but it is more than 'firsts' that make it the No. 1 Snorkel

Today more and more communities are choosing snorkels for aerial protection. Their first choice is Pitman Snorkel.

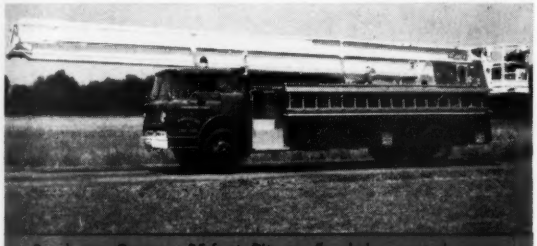
Why Pitman? The answer is simple. Pitman pioneered the snorkel concept; Chicago's No. 1 Snorkel is a Pitman. The first snorkel designed to carry a full complement of ground ladders and operate as a Truck Company, was the Pitman Snorkel, delivered to Memphis, Tennessee. Pitman also delivered the first snorkels mounted on a custom chassis and the first mounted on a Class A pumper chassis.

But, there are better reasons for the overwhelming preference for Pitman Snorkels than these "firsts."

The Pitman Snorkel is backed by more actual experience in snorkel design, fabrication and in-use operational experience than all other aerial platforms combined.

But judge the Pitman Snorkel for yourself. See it at the convention. Compare it with other machines. Talk to the Chiefs that have Pitman Snorkels. Or, if you can't make the convention, make a date with us now to see the new Pitman Snorkel color movie. Mail the coupon below. Or call direct for an early showing.

First Snorkel in combination with a class A pumper to be mounted on a custom chassis. Loves Park, Illinois, 50-foot Pitman Snorkel.



Roseburg, Oregon, 85-foot Pitman Snorkel mounted on a commercial chassis.

First Snorkel delivered on a commercial chassis with booster pump and booster tank. Springfield, Ill., 65-ft. Pitman Snorkel.

First Snorkel delivered on commercial chassis in combination with a class A pumper. Elko, Nevada, 50-foot Pitman Snorkel.

First Snorkel delivered on a commercial chassis designed to carry a full complement of ground ladders and operate as a truck company. Memphis, Tennessee, 65-foot Pitman Snorkel.

The Pitman Snorkel . . . first choice with these communities

DOWNEY, CALIFORNIA	NILES, ILLINOIS
CARSON CITY, NEVADA	SPRINGFIELD, ILLINOIS
SNOHOMISH, WASHINGTON	LOVES PARK, ILLINOIS
SOUTH BEND, INDIANA	WYOMING, MICHIGAN
ELWOOD, INDIANA	EDISON, NEW JERSEY
CHICAGO, ILLINOIS	ST. PETERSBURG, FLORIDA
BEDFORD PARK, ILLINOIS	BUFFALO, NEW YORK
BLUE ISLAND, ILLINOIS	ALBANY, NEW YORK
STEGER, ILLINOIS	NAMPA, IDAHO
HOMEWOOD, ILLINOIS	CHEHALIS, WASHINGTON

MERCER ISLAND, WASHINGTON

SNORKEL FIRE EQUIPMENT COMPANY
Department FE-9, Grandview, Missouri

☐ Please have representative call on me.
☐ I'd like to see the New Snorkel Movie.

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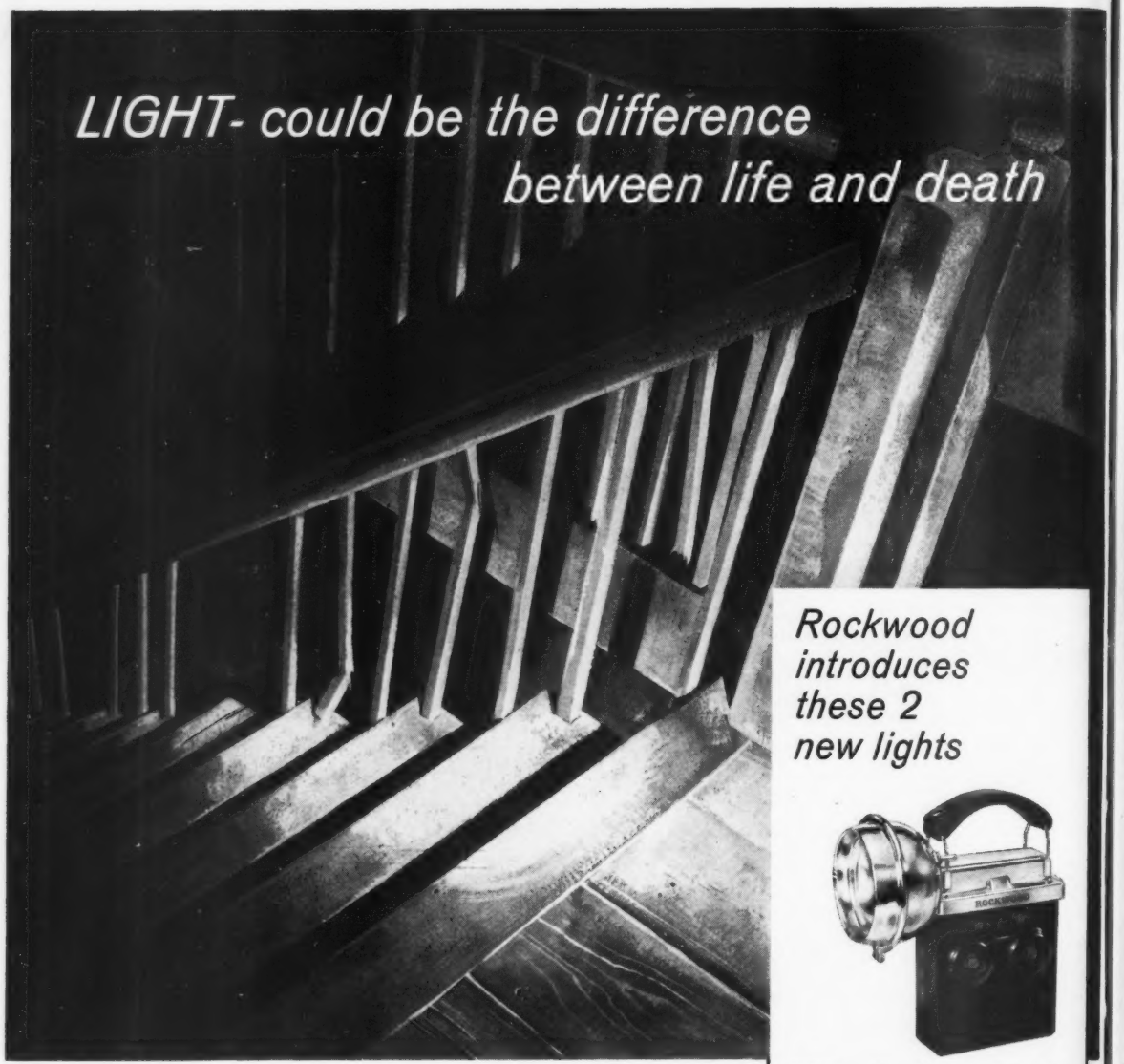
TITLE .....
ADDRESS .....
CITY ..... ZONE ..... STATE .....

☐ Please send specifications on the following Snorkels:
☐ 50' ☐ 65' ☐ 75' ☐ 85'



Rockwood introduces these 2 new lights

WetLITE — rechargeable type. ½ mile beam for up to 5 hours' continuous non-fading operation without recharge. Rechargeable 250 times. Rugged Butalite case, heavy-gauge stainless steel spotlight. Spillproof in any position.

DriLITE — disposable dry cell battery type. Up to 5 hours' continuous service. Adjustable focus for ½ mile beam or broad diffused light. Heavy-gauge stainless steel spotlight. Shoulder carrying strap included.

When every firefighter has his own portable light, he has another means of increasing his own safety and efficiency. And it also increases the chances of saving unconscious victims from darkened areas.

Lightweight, compact Rockwood lights are designed specifically for firefighters. For example, the rechargeable model can be used for five continuous hours without recharging — recharged on line voltage or truck-installed chargers. The disposable dry-cell battery includes shoulder strap for "hands free" use. Belt and helmet models are also available.

Learn more about the life-saving advantages of providing these economical portable lamps for *every* man in your department. Write for full details to Rockwood Sprinkler Company, Portable Fire Protection Department, 4001 Harlow Street, Worcester 5, Mass. A Division of The Gamewell Company, A Subsidiary of E.W. Bliss Company.

ROCKWOOD

PORTABLE FIREFIGHTING EQUIPMENT

look, Chief! Carrying 50 feet of "EZflex" is easy! I could hardly budge that old cotton rubber lined!

"EZflex" . . . the Modern Fire Hose. Half the Weight—Half the Bulk of Conventional Cotton Rubber Lined. 300 Lb. Test, S.J.—400 Lb. Test, D.J. 50 Ft., 75 Ft. and 100 Ft. Lengths.

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CLOTHING · EXPANSION JOINTS · PACKINGS · LINERS, ETC.

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AMERICAN LAFRANCE

Leadership

Combines superior product design and life-long service

Important Extra Value features in American LaFrance Fire Apparatus assure longer life, less maintenance and greater safety in operation.

THE AMERICAN LAFRANCE 900 Series fire apparatus represent years of experience (we are in our 127th year) in the design and production of fire fighting equipment. The 900 Series is the finest in appearance and quality of materials that competent engineers and skilled craftsmen can produce.

The 900 Series includes important features not illustrated that contribute to the excellence of these American LaFrance fire engines and aerial ladder trucks. Some of these Extra Values are:

Cab-ahead-of-engine design for maximum safety and visibility for driver and crew. 5-man seating. Four way adjustable driver's seat. Short turning radius and easy steering.

The chassis frame is a deep section pressed steel channel with all welded cross members for maximum load carrying capacity with minimum deflection.

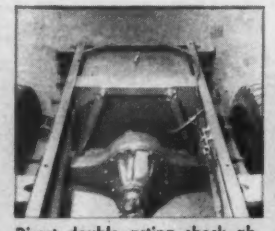
Engine cooling system is pressurized (4 p.s.i.) for efficiency and operation without loss of water or anti-freeze.

Six large enclosed compartments for weatherproof protection of equipment. Side compartments are "bolted-on" construction with sealing at all contact surfaces to prevent corrosion from salt solution so commonly used on today's highways and streets. This sealing cannot be done with "welded on" construction.

The TWINFLOW pump is built by American LaFrance and includes such features as single packing, adjustable, no special tools required; Bearium metal (high lead bronze) seal rings at the eye of each impeller; front bearing of Bearium metal, will not seize or score; impellers are in both static and dynamic balance for vibration free operation. Discharge gates are full flow (2½ inch waterway) ball type quarter turn with locking handle. The ball is hard chrome plated to eliminate corrosion and scoring. The American LaFrance discharge gates always work freely at any pressure.

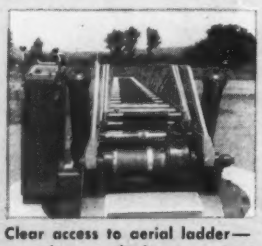
Six engine sizes (215 b.h.p. to 330 b.h.p.) provide a wide range in engine power selection. In addition, the gas turbine engine (330 b.h.p.) is available.

The long service life of American LaFrance fire engines is a matter of record. Several hundred American LaFrance fire engines over 40 years old are still in active service. All service requirements, both maintenance and parts, are available from American LaFrance.



Direct double acting shock absorbers at rear provide maximum safety. Prevents roll on turns.

Dual electric pumps, with dual fuel lines, one to mechanical pump, prevent vapor lock and insure continuous fuel supply.

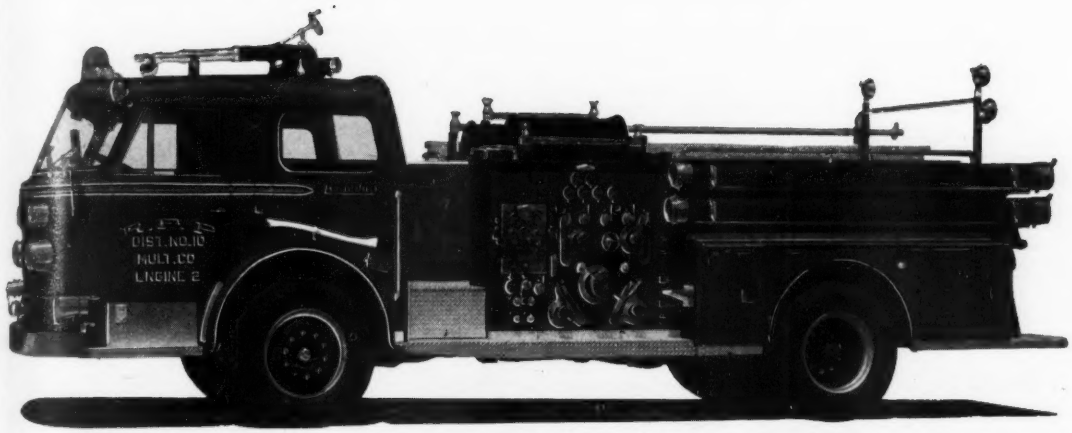


Clear access to aerial ladder—no tubes to climb over when ascending or descending ladder.

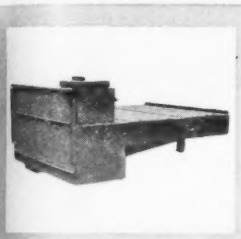
Turntable bearing rings 65 inches diameter for maximum ladder stability and control.

MODEL 4-85 aerial. Optional extra features shown: Federal Model Q2B Siren; Federal Beacon-Ray light; 200 gallon water tank booster pump; rear electric hose reel; enclosed compartments

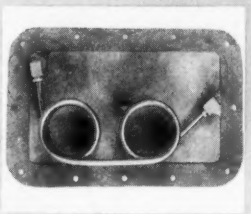
• **See the AMERICAN LAFRANCE Fire Engines at the I.A.F.C. conference**



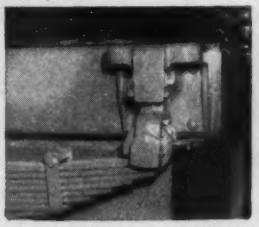
METROPOLITAN — 1250 g.p.m. Class A pumper. Also ALFCO 4 stage high pressure pump: Optional extras shown: front suction, 2½ inch; Akron deluge gun on cab roof; 110 volt outlets; Fyr-Fyter penetrator siren; rear red lights; Federal Beacon-Ray light; one extra booster reel and hose; two gated suction inlets; pressure gauges each outlet.



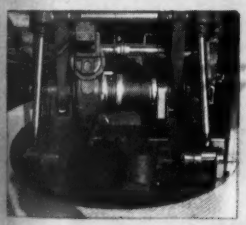
500 gallon water tank has sloping bottom, deep outlet sump, removable covers and is Zincilate treated.



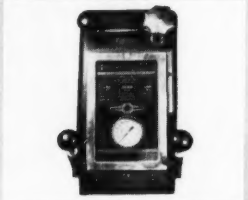
Cooling coils in pump transmission insure proper lubrication under all operating conditions.



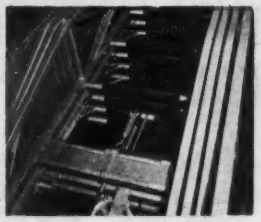
Chassis springs have secona leaf wrapped around eye as safety feature. All springs chrome manganese alloy steel.



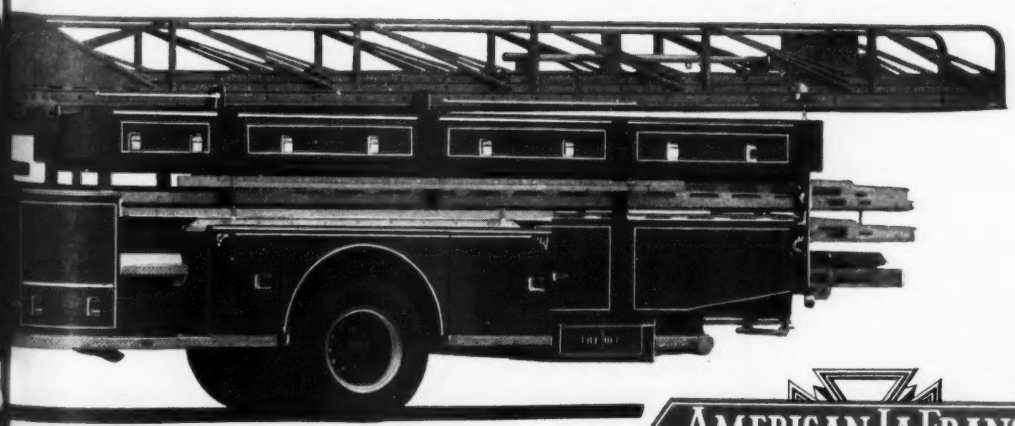
Clean design of turntable with no piping or rubber hose. By-pass valve in extension circuit easily accessible.



All controls directional. Visual indicators automatically register man load for all operating conditions.



Turnbuckles are provided for adjustment of each cable. Nothing to disconnect.



ver ground ladders; wood ground ladders; 6 ft. pike pole on erial ladder; side tool compartment; marker lights; Fi-Tronics mmunication system on aerial ladder and control tower.

AMERICAN LaFRANCE

A DIVISION OF STERLING PRECISION CORPORATION

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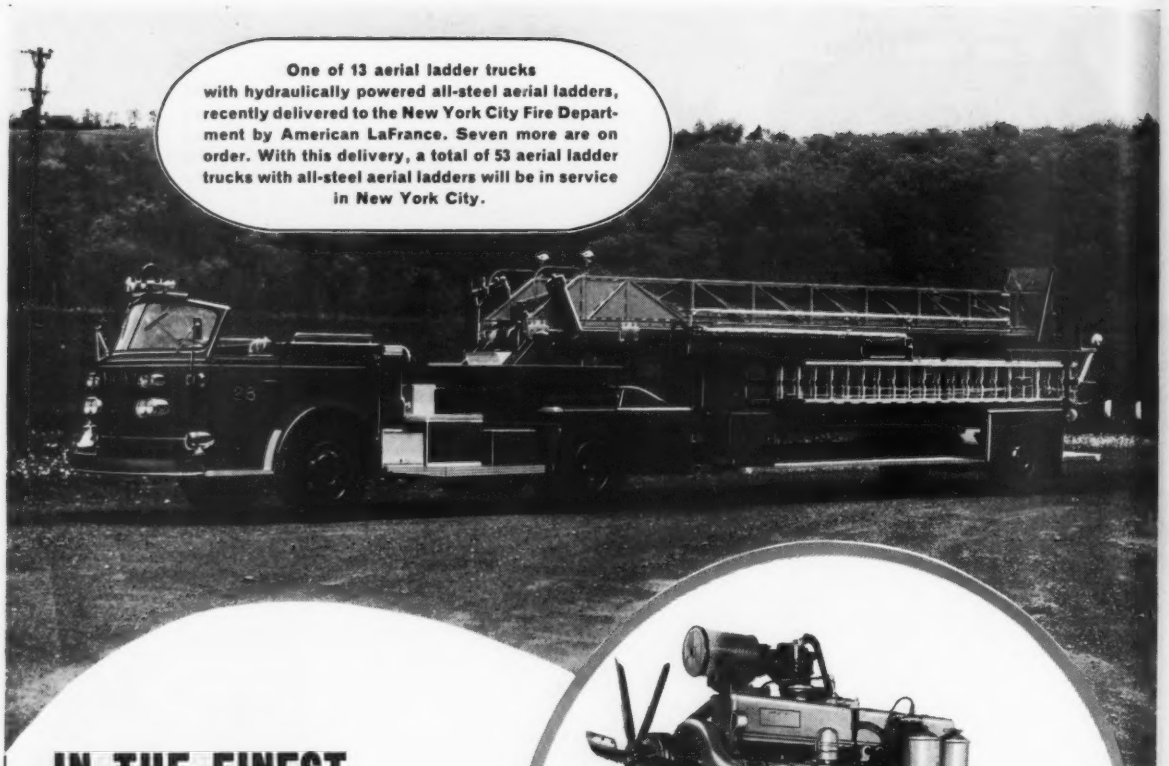
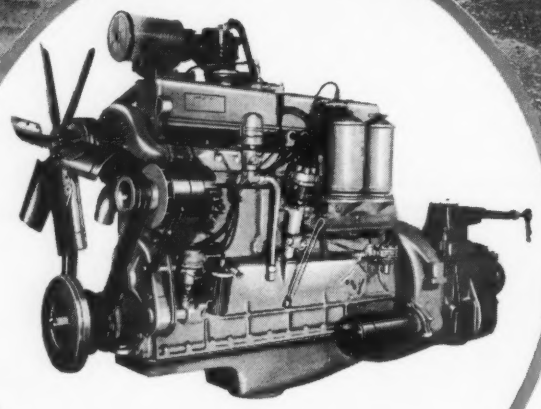
Toronto 18, Ontario, Canada



One of 13 aerial ladder trucks with hydraulically powered all-steel aerial ladders, recently delivered to the New York City Fire Department by American LaFrance. Seven more are on order. With this delivery, a total of 53 aerial ladder trucks with all-steel aerial ladders will be in service in New York City.

IN THE FINEST FIRE-FIGHTING EQUIPMENT

-CONTINENTAL PRECISE POWER



AMERICAN LAFRANCE-CONTINENTAL
MODEL L, 6-CYLINDER 275-HP
RED SEAL ENGINE.

Because fire-fighting apparatus must measure up to particularly high performance standards, Continental Motors takes special pride in its longstanding association with the leaders in that field. Here, as in other powered equipment, the familiar Red Seal trademark stands for reliability of an exceptional sort—for correct design, quality materials, and precision workmanship assured by experience dating from 1902. It is truer today than ever: ANY EQUIPMENT IS BETTER, WITH CONTINENTAL RED SEAL POWER.

CONTINENTAL MOTORS · Powerful as the Nation · AMERICA'S STANDARD ®

6 EAST 45th STREET, NEW YORK 17, NEW YORK • 6218 CEDAR SPRINGS ROAD, DALLAS 35, TEXAS • 3402 CENTURY BOULEVARD, INGLEWOOD, CALIFORNIA • 1252 OAKLEIGH DRIVE, EAST POINT (ATLANTA) GEORGIA

Continental Motors Corporation

MUSKEGON • MICHIGAN

FACTORY-APPROVED SERVICE AND GENUINE RED SEAL PARTS ARE AVAILABLE ALL OVER THE WORLD

"One life net has justified all previous expenditures for this type of equipment."

WILLIAM F. MURRAY, CHIEF
SAN FRANCISCO FIRE DEPT.

CITY AND COUNTY OF SAN FRANCISCO

SAN FRANCISCO FIRE DEPARTMENT

OFFICE
CHIEF OF DEPARTMENT
ROOM 2, CITY HALL

January 31, 1961

Mr. Alfred H. Jacobson
Sales Manager
Atlas Safety Equipment Company, Inc.
179 North 10th Street
Brooklyn 11, New York

Dear Mr. Jacobson:

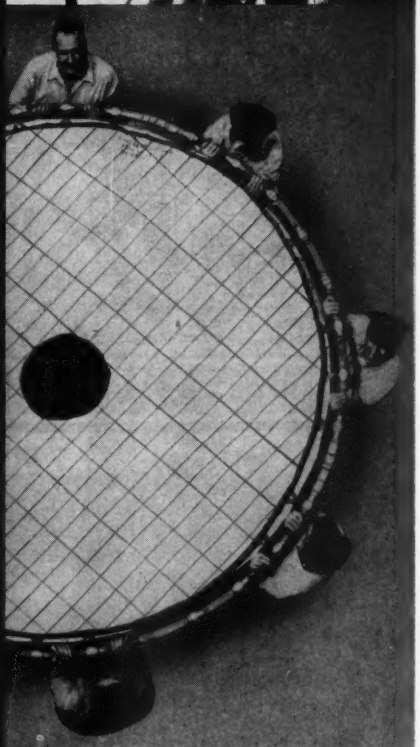
I appreciate your interest in the life net used at the Thomas Hotel fire on January 6, 1961.

An Atlas quarter-fold life net, carried on our Truck Company No. 1, figured in a successful rescue. This single instance, in my estimation, is a graphic justification for retention of nets as part of a truck company's equipment.

The crews of two of the first three engine companies to arrive manned the net, when two women appeared in third story windows with fire at their backs and threatening to jump. Whether they heard the exhortations and instructions from the firemen below to "jump clear and land on your butt" will never be fully determined except that results were excellent. The first to jump, made a successful landing and was quickly deposited on street. The net was rapidly repositioned and the younger woman jumped in a perfect landing. Those who witnessed the second jump contend no amount of training could have produced a more splendid execution. Neither of the women suffered noticeable injury. There isn't the slightest doubt in my mind that, but for the presence of this net barely but sufficiently manned by an adequate force schooled in its application, the women would have jumped to their possible death or, at least, serious injury. There is no measurable price tag on human life but, in my opinion the saving of these women in one life net has justified all previous expenditures for this type of equipment.

With thankfulness in having a high quality net at hand to perform these most gratifying rescues. I am

Very truly yours,
William F. Murray
Chief of Department



These rescues, like so many before, were made with an ATLAS "Deluxe" model life saving net . . . the only net with patented dual shock absorbers and safer self-locking hinges.

FOR THE SAFEST & MOST DEPENDABLE LIFE SAVING NETS . . . SPECIFY

"ATLAS DELUXE"

when preparing requisition for life nets or specifications for fire apparatus.

ATLAS SAFETY EQUIPMENT CO., INC.
175 NORTH 10th STREET • BROOKLYN 11, N.Y.

BRUCO

BRUMBAUGH BODY COMPANY ALTOONA, PENNA

Limited number of DEALER FRANCHISES Available

PUMPER: SQUADS, AERIALS & EMERGENCY TRUCKS

CUSTOM BUILT TO HIGHEST STANDARDS

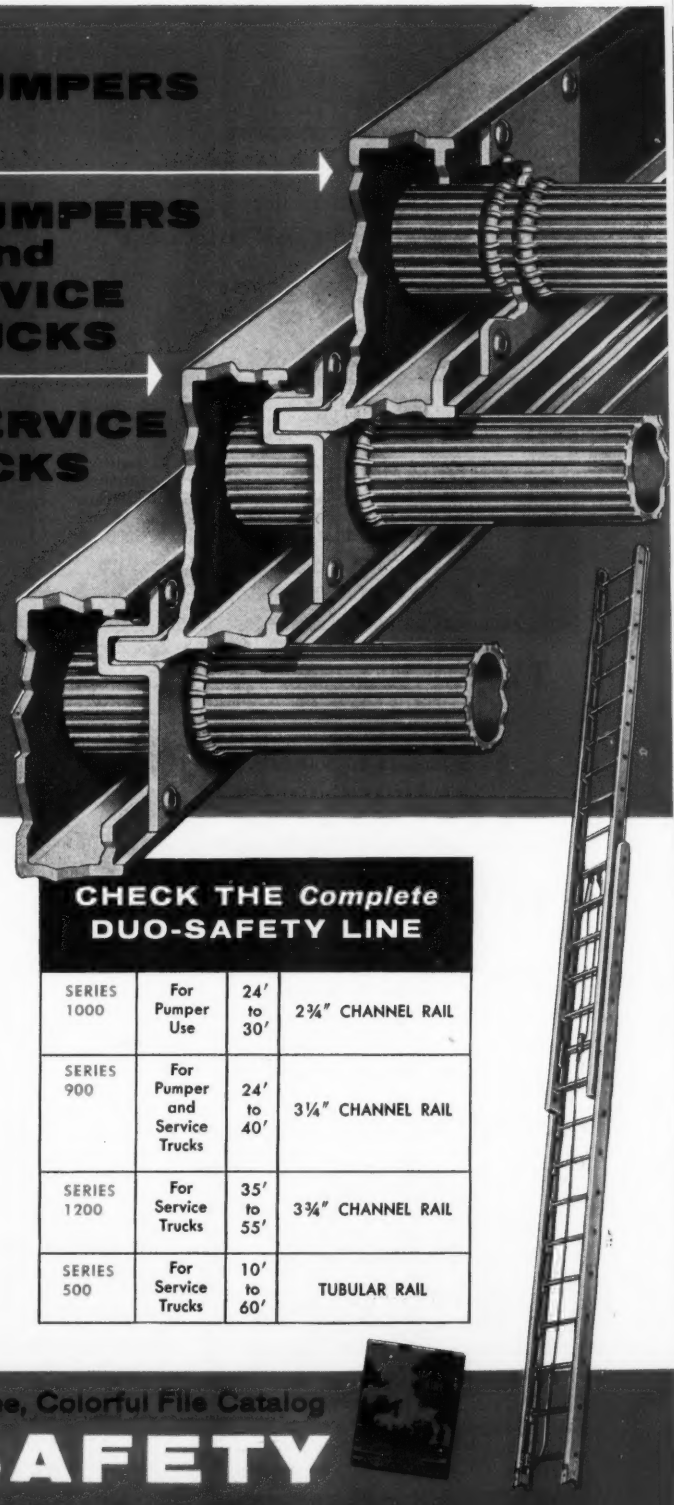
Whether you need a deluxe pumper, squad wagon, city service truck or emergency vehicle—you can be sure of the best value for your fire company dollar when you leave responsibility to Brumbaugh.

NOW... Famous Duo-Safety Tongue and Groove Construction in 3 Great Ladders

Series 1000 FOR PUMPERS

Series 900 FOR PUMPERS and SERVICE TRUCKS

Series 1200 FOR SERVICE TRUCKS



No Jackknifing
No Hooks
No Guides

Whatever your requirements, you have more to choose from with Duo-Safety—three aluminum ladder series, all featuring revolutionary, exclusive Tongue and Groove Construction. This outstanding ladder design holds the sections together firmly, rigidly—and without brackets, hooks, or obstructions of any kind. They require a minimum of banking space, are especially stable in the longer 3-section lengths. Series 900, 1000 and 1200 are identical in design, vary only in rail sizes and lengths. Check the Duo-Safety line for the exact ladder for your needs—there's a ladder best for you—and your budget.

CHECK THE *Complete* DUO-SAFETY LINE

SERIES 1000	For Pumper Use	24′ to 30′	2¾″ CHANNEL RAIL
SERIES 900	For Pumper and Service Trucks	24′ to 40′	3¼″ CHANNEL RAIL
SERIES 1200	For Service Trucks	35′ to 55′	3¾″ CHANNEL RAIL
SERIES 500	For Service Trucks	10′ to 60′	TUBULAR RAIL

DUO Safety

Write for Free, Colorful File Catalog

DUO-SAFETY LADDER CORPORATION OSHKOSH, WISCONSIN

In Canada: La France Fire Engine and Foamite, Ltd., Toronto

Choose from Barton-American

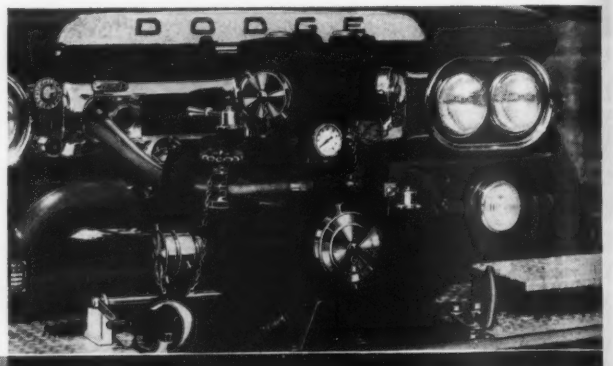
...pumps to meet all your needs...and meet them best

TYPE UA

FRONT-MOUNTED PUMPS
500-750 GPM CLASS "A" RATING

Ample pressure for fog gun operation. Fights fires "on the move".

FULL DETAILS IN BULLETIN 8330-C

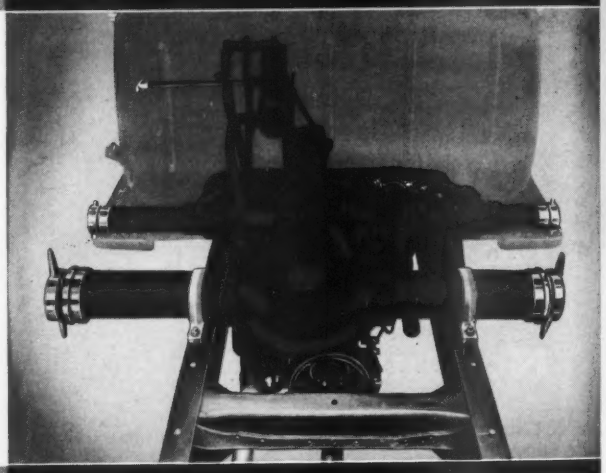


TYPE DMA

TWO-STAGE MIDSHIP PUMPS
500-750 & 1000 GPM CLASS "A" RATING

High pressure for fog gun service.
2 Independent pumps. 3 Pressure & Volume selections.

FULL DETAILS IN BULLETIN 8733



TYPE DMB

TWO, THREE & FOUR STAGE OPERATION

Pressure to 850 Lbs.

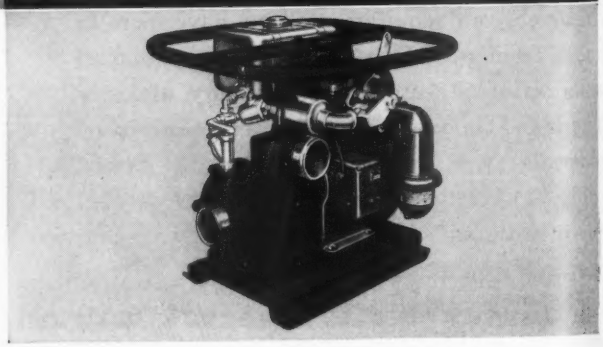
FULL DETAILS IN BULLETIN 8734

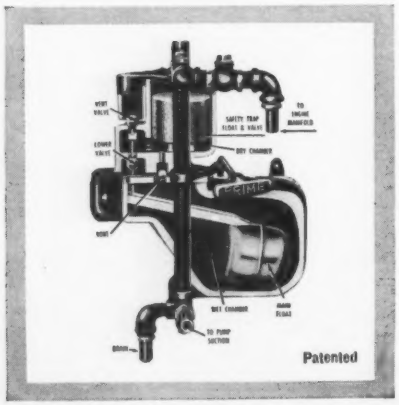
TYPE 3XD

PORTABLE PUMP
200 GPM & UP

Pressure to 90 Lbs.
Weighs only 125 Lbs.
A versatile unit for any department.

FULL DETAILS IN BULLETIN 8120





. . . and the famous Barton-American ENGINE VACUUM PRIMER

REQUIRES NO OIL, NO ADJUSTING, NO MAINTENANCE

Always operates with like-new efficiency—not affected by engine wear.
Employs a simple, trouble-proof principle.
Completely frost-proof. Always dependable.

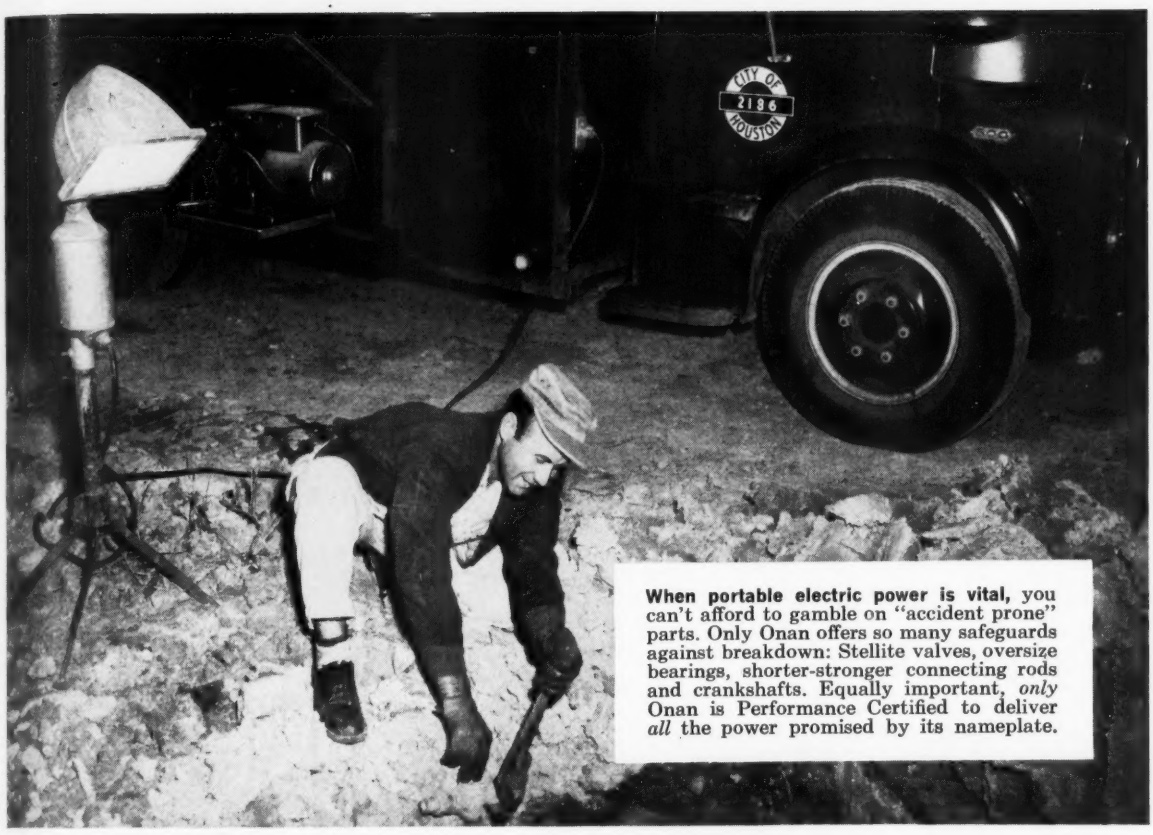
FULL DETAILS IN BULLETIN 8733

SEE YOUR NEAREST AMERICAN FIRE PUMP DEALER

Visit us at Booth 40
IAFC Convention
September 25 to 28th.

AMERICAN FIRE PUMP COMPANY

P. O. Box 219-A
BATTLE CREEK, MICHIGAN, U. S. A.



When portable electric power is vital, you can't afford to gamble on "accident prone" parts. Only Onan offers so many safeguards against breakdown: Stellite valves, oversize bearings, shorter-stronger connecting rods and crankshafts. Equally important, *only* Onan is Performance Certified to deliver *all* the power promised by its nameplate.

Only Onan is certified to give you all the power promised by its nameplate

It's a fact that many electric plants on the market today do not deliver the output promised by their nameplate rating.

Every Onan plant is given a rugged workout *under full load* before it is shipped—*your assurance* that the Onan you buy is ready for hard work the day you get it.

But this isn't enough. Independent laboratory inspectors pull surprise inspections to double-check our tests and testing methods. They pull a plant off the line, run it, stop it, load it, overload it, check and recheck. Their torture test gives positive proof of Onan's quality. End result: *Onan's exclusive Performance Certification* . . . your assurance of getting every watt of power you pay for.

So when you're tempted by an electric plant "bargain," make sure its nameplate rating is not "inflated." Be sure you're getting full measure for your money. Remember, *the electric plant that shortchanges you in power output is no bargain at any price!* Only Onan is Performance Certified to deliver everything the nameplate promises.

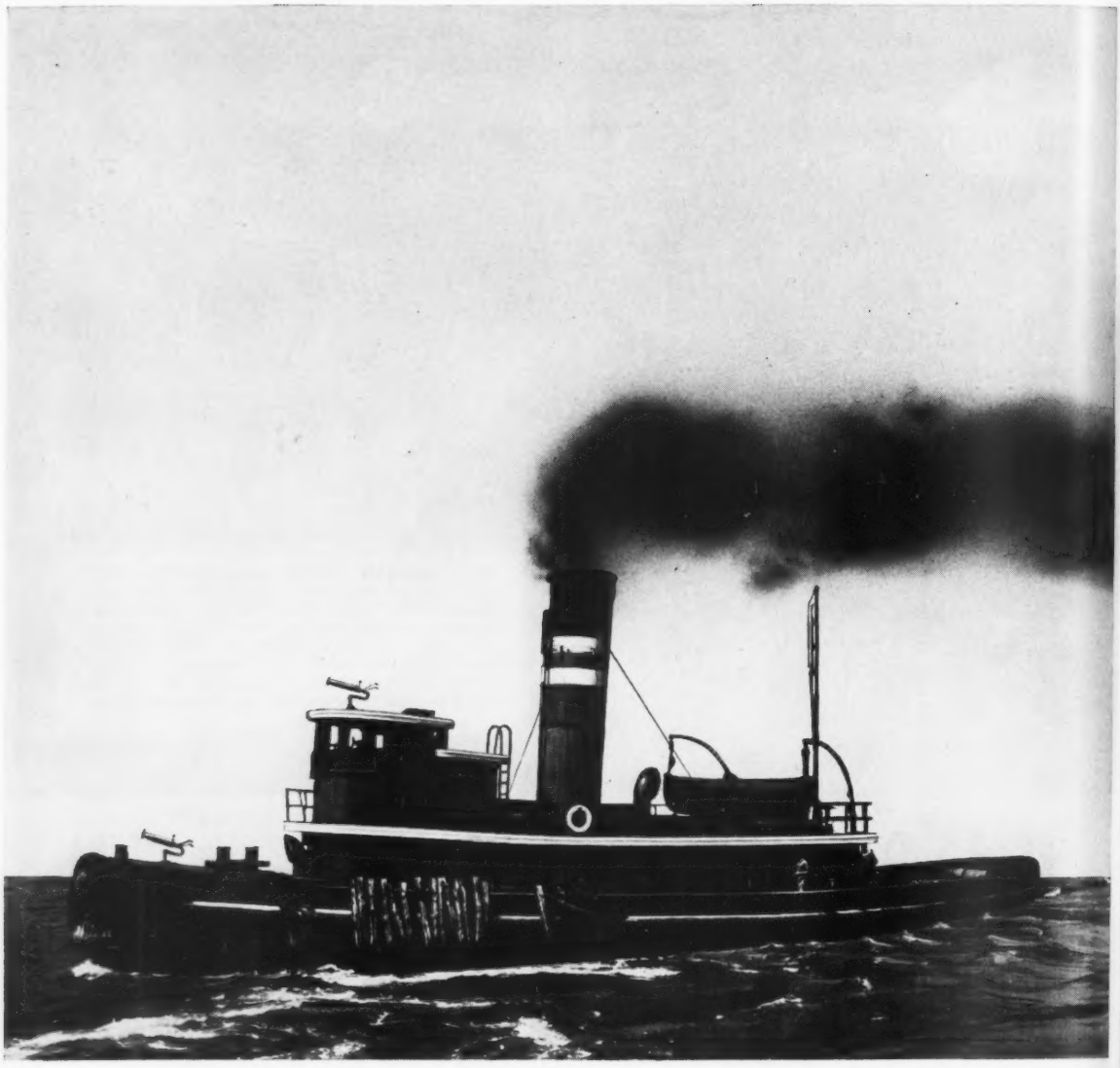
See Onan electric plants soon. Compare before you buy. You'll find your Onan distributor listed in the Yellow Pages. Call him or write direct.

PERFORMANCE CERTIFIED
We certify that when properly installed and operated this Onan electric plant will deliver the full power and the voltage and frequency regulation promised by its nameplate and published specifications. This plant has undergone several hours of running-in and testing under realistic load conditions, in accordance with procedures certified by an independent testing laboratory.
Onan
Onan

World's Leading Builder of Electric Power Plants

Onan

ONAN Division, Studebaker-Packard Corporation, 2631 University Ave. S. E., Minneapolis 14, Minn.

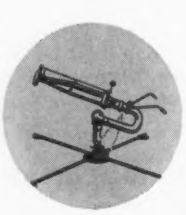


Tug or Fireboat? Both...thanks to Aer-O-Foam

This is an **auxiliary fireboat** . . . a vessel normally operating as a tug, but also equipped with a water pump and an Aer-O-Foam system enabling it to double as a fireboat.

To many port authorities and water-side industrial plants, the auxiliary fireboat brings the ideal answer to the problem of providing fireboat protection at costs within budget limitations.

Like a full-fledged fireboat, the specially equipped tug can fight fire with both foam and plain water. It can maneuver to combat either ordinary fires or petroleum fires in tankers, freighters, passenger ships, docks, warehouses. Working from the offshore side, it can reach fires sometimes inaccessible to land-based equipment.



Our Engineering Department is ready to design the correct combination of pumps, tanks, hose lines and nozzles to make the most effective conversion of any tug you designate. Get in touch with the nearest National Foam office or distributor.

National Foam System, Inc.

West Chester, Pa.

"We're equipped for any emergency with our 'SCOTCH·SHIELD' suits!"

ALUMINIZED FABRIC

says Chief J. C. Miller of the Dayton Municipal Airport Fire Department, Dayton, Ohio

"Every man on our crash truck crew is protected with a suit of 'Scotch·Shield' Aluminized Fabric. In fact, we've been completely 'aluminized' for six years."

"It's a lot easier getting into these lightweight, heat reflective suits than that bulky, insulating type."

"The men like the freedom of movement they get with 'Scotch·Shield' Fabric. I've noticed they move faster, too!"

"Our training sessions over at Wright-Patterson Field have taught each man the proper use of his equipment. And he has learned to have complete confidence in it. He knows he has been provided with the best."

"Now that jets are coming into Dayton, I'm happy we're already equipped for any emergency with our 'Scotch·Shield' Fabric suits."

REFLECTS 90% OF RADIANT HEAT. There's a "Scotch·Shield" Aluminized Fabric for every use . . . glass and asbestos fabrics for fire entry and proximity garments, flameproof rayon fabric for fire approach suits. Vapor-coated with pure aluminum. Light, flexible. Available from fire equipment suppliers. Mail coupon for details.

SCOTCH·SHIELD® BRAND ALUMINIZED FABRIC

MINNESOTA MINING AND MANUFACTURING COMPANY 3M

The 3M Company, Dept. RBX-91, St. Paul 6, Minnesota

☐ Please send free literature on "Scotch·Shield" Aluminized Fabric.
☐ Please send names of suppliers of "Scotch·Shield" Fabric garments.

Name_____

Title_____

Fire Dept._____

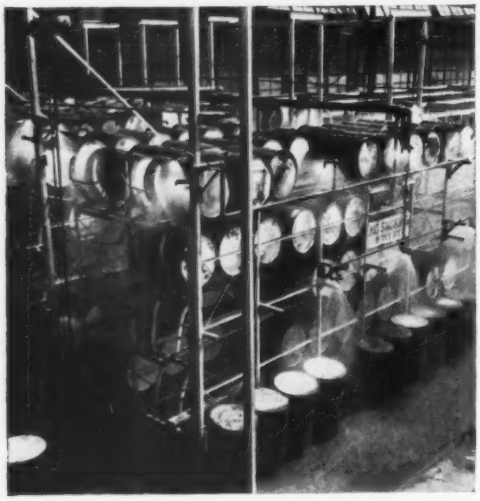
Address_____

City_____ State_____

Whatever the special fire hazard, Grinnell has the right system to handle it

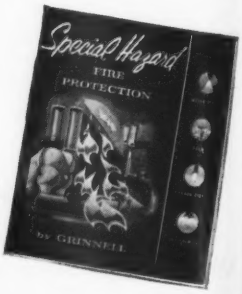
The basic fire extinguishing agents are shown on the chart below with the most common applications cross-referenced by check marks. If a production process requires a specially designed system — the research and test facilities of the Grinnell Company are available in case of need.

Extinguishing blanket of foam completely covers the floor of this aircraft hangar. 5,897 foam-water sprinklers protect property worth a billion Air Force Defense dollars.



Water spray, applied to outside storage of paints and solvents, cools to inhibit internal pressure build-up and dilutes to prevent flammable vapor-air mixtures from developing.

SPECIAL FIRE HAZARD	WATER SPRAY	FOAM	CARBON DIOXIDE	DRY CHEMICAL
AIRCRAFT HANGARS	✓	✓		
ALCOHOL STORAGE	✓	✓	✓	
AMMUNITION LOADING	✓			
AMMUNITION MAGAZINES	✓			
ASPHALT IMPREGNATING	✓			
BATTERY ROOMS			✓	
CARBURETOR OVERHAUL SHOPS	✓	✓	✓	✓
CLEANING PLANT EQUIPMENT	✓	✓	✓	✓
DOWTHERM	✓			
DRYING OVENS	✓		✓	✓
ENGINE TEST CELLS	✓	✓	✓	
ESCALATORS, STAIR WELLS	✓			
EXPLOSIVES: MANUFACTURING, STORAGE	✓			
FLAMMABLE LIQUIDS STORAGE	✓	✓	✓	
FLAMMABLE SOLIDS STORAGE	✓			
FUEL OIL STORAGE	✓	✓		
HANGAR DECKS	✓	✓		
HYDRAULIC OIL, LUBRICATING OIL	✓		✓	
HYDRO-TURBINE GENERATORS	✓		✓	
JET ENGINE TEST CELLS	✓	✓	✓	
LIGNITE STORAGE AND HANDLING	✓			
LIQUEFIED PETROLEUM GAS STORAGE	✓			
OIL QUENCHING BATH	✓	✓	✓	✓
PAINTS: MANUFACTURING, STORAGE	✓	✓	✓	✓
PAINT SPRAY BOOTHS	✓		✓	✓
PETROCHEMICAL STORAGE	✓	✓	✓	
PETROLEUM TESTING LABORATORIES	✓	✓	✓	
PRINTING PRESSES			✓	
REACTOR AND FRACTIONATING TOWERS	✓			
RECORD VAULTS			✓	
RUBBER MIXING AND HEAT TREATING	✓			
SHIPBOARD STORAGE	✓		✓	
SOLVENT CLEANING TANKS		✓	✓	✓
SOLVENT THINNED COATINGS		✓	✓	✓
SWITCHGEAR ROOMS			✓	
TRANSFORMERS, CIRCUIT BREAKERS (outdoors)	✓			
TRANSFORMERS, CIRCUIT BREAKERS (indoors)	✓		✓	
TURBINE LUBRICATING OIL	✓	✓	✓	✓
VEGETABLE OIL, SOLVENT EXTRACTION	✓	✓		



There's a Grinnell Fire Protection System to protect every type of property. Grinnell designed and installed systems are backed by over 90 years of fire protection experience. Send for this free 44-page booklet today. Write Grinnell Company, Providence 1, R. I.

PROJECT YOUR COMMANDS

...like a Harpoon!

AUDIO

'TP' HAILER

transistor-powered

PORTABLE MEGAPHONE

Puts you in Control...
for a Half Mile in Every Direction!

AUDIO EQUIPMENT CO., INC.
P.O. Box 192, Port Washington 37, N. Y.
Send Audio "TP" Hailer catalog and prices:

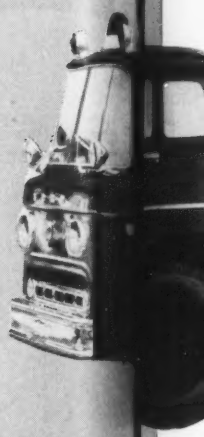
CHIEF_____

DEPT._____

ADDRESS_____

CITY_____ ZONE (IF ANY)____ STATE_____

John BEAN BUILDS THEM BETTER TO



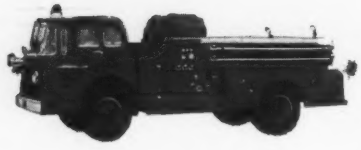
Designed, tested and built for superior performance, John Bean Firefighters have proven their dependability in community service the world over. Engineering "know how", based upon decades of experience, insures rigid quality standards in every unit. Famous Bean pumps exemplify John Bean dependability. The efficient, high pressure pump is unmatched for true, high pressure fog fire fighting. The Class A centrifugal volume pump meets every performance standard of N.B.F.U. tests. Depend on John Bean Firefighters—built better to meet your needs best.

FEATURING ORIGINAL HIGH PRESSURE FOG

John Bean original high pressure fog is a scientific, proven fire fighting method distinguished from all other types. Operating at 850 psi, the rugged John Bean pump produces microscopic fog particles discharged from the patented Bean Fog Gun. Driven at high velocity to the base of the fire, these particles have many times the surface area and heat absorption power of a low pressure stream. So much so that one gallon of water as high pressure fog has the fire killing power of ten or more gallons discharged in a volume stream.

SQUAD AND RESCUE UNIT

High pressure fog fire fighter specially designed for rescue. Ample storage capacity with spacious, weatherproof compartments. 500-gal. water tank.



HPF* FIRE FIGHTER

Ideal for rural fire protection where water supply is limited. Equipped with original high pressure fog*. Full, 500-gal. water tank; compartmentized body.

CLASS "A" TRIPLE COMBINATION PUMPER

Triple combination pumper with Class A centrifugal volume pump for 500, 600 and 750 gpm performance. Forward control chassis with compartmentized body.

MODEL 400-F

Specially designed for small towns, resort areas, and western range patrols. High pressure fog equipped with two, 200-ft. hose reels; 400-gal. water tank.

MODEL 250-F

Compact, fast and mobile. Fights brush, grass and forest fires on the run with high pressure fog. Compartmentized body; 250-gal. water tank.

FIRE TANKER

Available with 500, 600, 750 and 1000 gal. tanks. Plenty of storage space in the modern, compartmentized body.

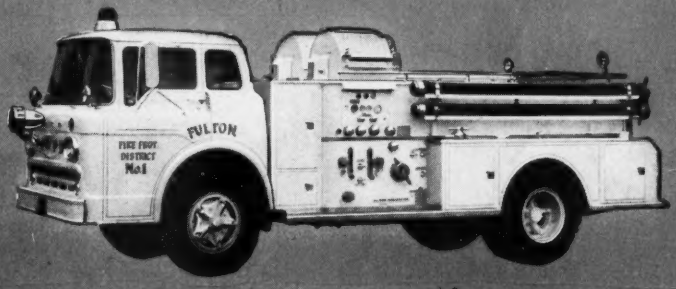
***HPF — High Pressure Fog**
HPV — High Pressure Fog-Volume (Combination)

for proof of John BEAN Firefighter effectiveness, write today fo

TO MEET YOUR NEEDS BEST!

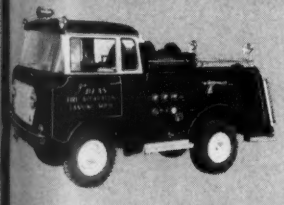
65′ AND 75′ AERIALS

Dual hydraulic ladder control system for utmost safety. High pressure fog and volume equipped; aerial ladder available in all steel or with steel base and aluminum sections. Hydraulically operated 360° turntable and hydraulic outrigger jacks.



HPV* FIRE FIGHTER

Forward control chassis; 500, 600 and 750 gpm volume capacities plus high pressure fog; compartmentized body; 1600-ft. capacity hose bed; 500-gal. water tank.



ODEL 200-F

ounted on forward control, llys "Jeep" chassis with 4- heel drive. High pressure fog; g hose bed; 200-gal. water tank.

INDUSTRIAL FIRE FIGHTERS

Compact, true high pressure fog fire apparatus for in-plant protection. Designed for tight maneuvering through factory aisles; 200-gal. water tank.

demonstration in your community

John BEAN®

DIVISION OF
FOOD MACHINERY AND CHEMICAL CORPORATION
LANSING, MICHIGAN • SAN JOSE, CALIFORNIA.

fmc

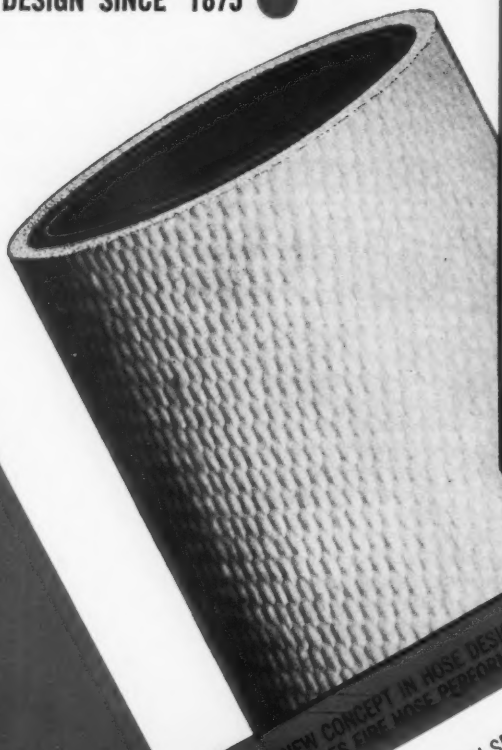
THE GREATEST ADVANCE IN FIRE HOSE DESIGN SINCE 1875

EUREKA

presents

MULTEX®

MULTIPLE WOVEN



1 A NEW CONCEPT IN HOSE DESIGN RADICALLY CHANGES FIRE HOSE PERFORMANCE AND LIFE

2 MULTEX IS ALWAYS IN SERVICE . . . REPACK IT WET.

3 EXTREMELY FLEXIBLE IN SUB-ZERO TEMPERATURES.

4 20% LIGHTER THAN CONVENTIONAL FIRE HOSE PLUS 30% GREATER TRUCK BED CAPACITY.

5 ABSOLUTELY MILDEW RESISTANT . . . 100% SYNTHETIC FIBERS.

6 DESIGNED TO ACCOMMODATE INCREASED HYDRO-STATIC PRESSURE.

7 TOUGH • RUGGED • DEPENDABLE • ECONOMICAL

DEMAND THE VERY BEST...
Specify Multex Multiple Woven Fire Hose

EUREKA FIRE HOSE DIVISION
UNITED STATES RUBBER COMPANY
BOX 408 NEWTOWN, CONN.

QUALITY OR PRICE?

MAIL THIS COUPON TODAY
FOR INFORMATION

NAME .....

ADDRESS .....

.....

SAMUEL EASTMAN CO., INC.
CONCORD, NEW HAMPSHIRE

ONLY FROM GMC

FAST-STARTING, TOP-PERFORMING V-6 FIRE FIGHTERS!

Exclusive GMC V-6s have sure-fire ignition and balanced fuel systems to get started fast, without complicated dual ignition and bothersome many-barreled carburetion.

Full power is produced at low engine speed, over a broad range, to get to the desired road speed fast and maintain it without a lot of gear shifting.

GMC V-6 engines are also built for extra-long life; minimum maintenance; economy that squeezes the most from every drop of gas.

You can choose from six V-6 power plants . . . 150 to 210 hp . . . 500 to 1000 gallons per minute pumping capacity. Your GMC Dealer listed in the Yellow Pages will gladly give you all the specific data, including prices.

GMC
GENERAL MOTORS CORPORATION
TRUCKS

GMC V-6 and V-12 engines meet all the requirements to pump 500 to 1500 gallons per minute . . . 90" and 105" Conventional Cabs and 72" Tilt-Cabs.

GMC Truck & Coach—
a General Motors Division—
Pontiac, Michigan.

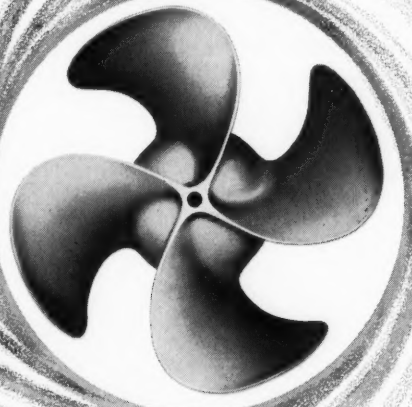
12

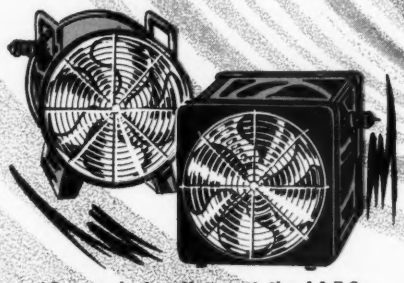
Pump 1500 Gallons Per Minute At The Lowest Possible Cost With The Most Powerful Standard Production Gas Engine Built...The GMC 299 hp. V-12.

You Get
Controlled Ventilation
with SUPER VAC Smoke Ejectors!

Super Vac Smoke Ejectors rid the area of smoke and fumes by the powerful vacuum action from specially designed blades. As a blower, Super Vacs force a tremendous blast of fresh air into the smoke-congested area to reduce combustion and asphyxiation dangers. Fire Departments throughout the United States and many foreign countries depend upon Super Vacs for controlled ventilation and smoke elimination. Don't gamble with safety. Try Super Vac dependable performance.

Write for your copy of the All New Super Vac OPERATIONAL MANUAL 61—just off the press (available at our convention booth).*

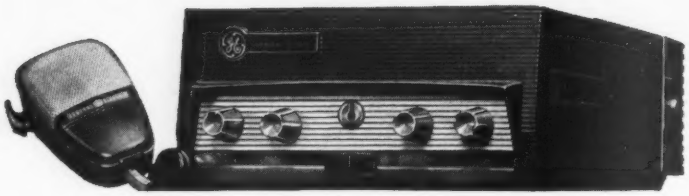




*See us in Las Vegas at the I.A.F.C. Convention Sept. 25-28 and register at our booth for FREE Smoke Ejector.

SUPER VACUUM MANUFACTURING CO., INC.
1055 East First Street / Loveland, Colorado / NOrmandy 7-5146

A General Electric Two-Way Radio to solve every communication need



General Electric's TPL:
Extra-feature performance leader

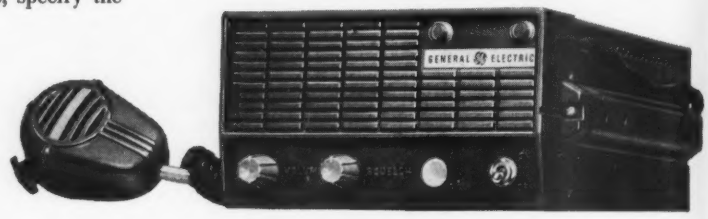
General Electric's Transistorized Progress Line offers highest performance . . . plus standby battery drain so low that you never have to turn off your TPL mobile unit . . . and a size that fits in more places, in more different positions, than any other two-way mobile radio you can buy today.

The Progress Line:
Proven performance leader

Since 1955 General Electric's tubed Progress Line has served customers with economical, high power, high reliability two-way radio. A wide range of models satisfies every mobile communication requirement. For field-proved performance and low maintenance cost even under the most rugged conditions, specify the Progress Line.

The General Electric Pacer:
Compact economy leader

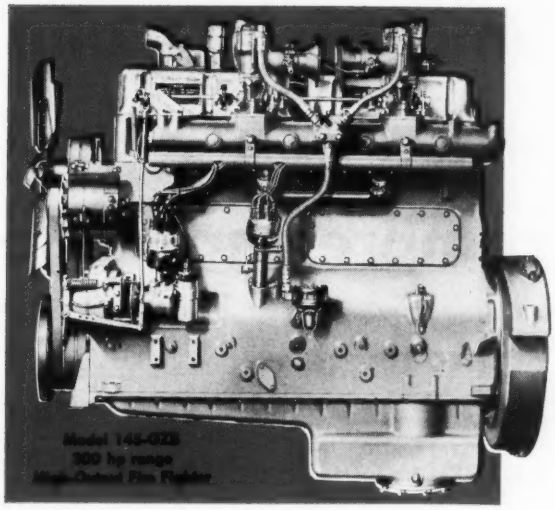
The General Electric Pacer gives you every advantage of quality FM communication for limited range applications at the exceptionally low price of $419.00 . . . and the lowest battery drain of any mobile radio in its class means important additional savings for you.



General Electric two-way mobile radios — each the leader in its class — are designed and engineered to satisfy your specific requirements. For the range you want and the high quality reception you need, check first with a G-E communications consultant. You'll find him listed under "Radio Communication" in the Yellow Pages of your classified telephone directory. Or write: General Electric Company, Communication Products Department, Section 1291, Lynchburg, Virginia.

GENERAL ELECTRIC

first in FIRE FIGHTING for over 50 years!



Waukesha has been building engines for fire equipment for over fifty years. Since one of its first internal combustion engines for fire fighting service was sold to the Chicago Fire Department in 1908, Waukesha Fire Fighter Engines have been used throughout the United States, and in many foreign countries, in the finest fire equipment built by leading manufacturers.

FWD CORPORATION · CROWN Firecoach · Thibault · Seagrave · HF HOWE · Fire Master Corp. · MAXIM MOTOR COMPANY · AF AMERICAN FIRE EQUIPMENT COMPANY · UNIVERSAL · GENERAL FIRE TRUCK CORP. · PIRSCH · OREN · WARD LA FRANCE · CENTRAL

WAUKESHA FIRE FIGHTER ENGINES

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.
New York • Tulsa • Huntington Park, Calif.
Factories: Waukesha, Wis.; Clinton, Iowa; Houston, Texas

...up to 300 hp

526

Checking on performance of Waukesha Fire Fighter Engines.

Smoke can't blind or choke when you wear NORMALAIR compressed air breathing set

Approved in the United Kingdom for Industry and Fire Service and extensively used for such extra protection as:

- SMOKE PROOF MASK
- 7 MINUTE WARNING WHISTLE
- OPERATES UNDER WATER (if necessary)

The outstanding feature of this apparatus is its simplicity; all complicated and unreliable mechanisms have been completely eliminated, resulting in exceptional ease of operation and maintenance. These facts have been fully substantiated through exhaustive tests carried out in collaboration with the Fire Services, where it has been proved that the apparatus gives very long periods of safe, trouble free service, with negligible routine attention.

A diaphragm type speech transmitter is incorporated as a standard fitting in the mask, together with a whistle warning unit, which gives an audible signal when the cylinder pressure falls below a pre-set figure.

The weight of the set fully charged is 29 lbs. and the endurance is approximately 28 minutes at a normal work rate.

In circumstances where space is restricted, the set can be removed completely with the exception of the face mask. Breathing is in no way affected by this manoeuvre.

The Terylene reinforced rubber hoses used will withstand pressures up to 10,000 lb./sq. in., will not kink and are virtually uncrushable. The end fittings are securely attached and will stand a pull of over 600 lb.

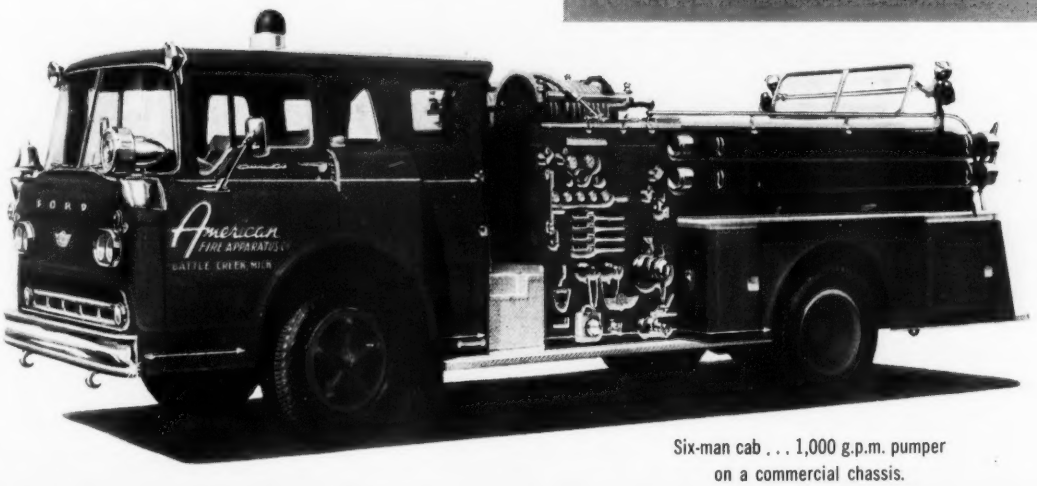
COMPARE AND SEE HOW IT MEETS YOUR MOST STRINGENT REQUIREMENTS

For full information, write to:

NORMALAIR (CANADA) LIMITED

1425 The Queensway **Toronto, Ontario.** **Telephone: CLifford 5-4481**

NEW... from AMERICAN FIRE APPARATUS...



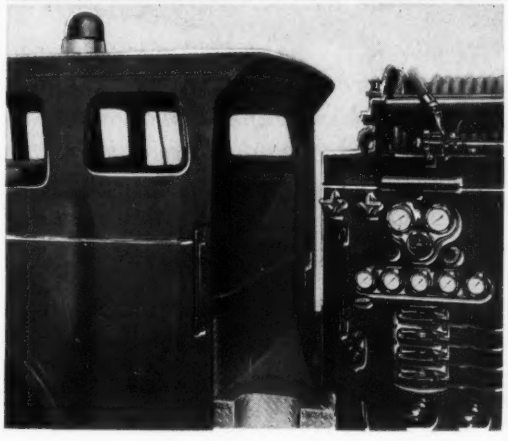
Six-man cab . . . 1,000 g.p.m. pumper on a commercial chassis.

SIX-MAN CAB on a commercial chassis

Now, for the first time, you can get a spacious six-man cab on a commercial chassis. You get advantages never before offered, even in custom-built trucks. Here is truly fine engineering and craftsmanship, so typical of *American* Fire Apparatus. It is another example of how *American* helps make your fire-fighting job easier and increases your efficiency.

- Firemen can get out of either side of the broad rear seat — straight-through unobstructed passage from one side of the truck to the other.
- Sliding window permits easy communication between front and rear seats.
- Front and rear portions of cab are constructed as a single rugged unit.
- Rear section of cab has its own dome light.
- Side windows of safety plate glass are mounted in heavy rubber seals.
- Entire cab tilts forward, providing ready access to engine.

Wide comfortable seat, ample headroom, straight-through passage with no obstructions.



For complete details about this new six-man cab, see your nearest **American** representative.

American

AMERICAN FIRE APPARATUS CO.

FIRE APPARATUS CO.

Main Office: Main Street Rd., Battle Creek, Mich. Plants at: BATTLE CREEK, MICH., MARSHALLTOWN, IA., STRATFORD, ONT.

10,000 Handy RESUSCITATORS

...over ten thousand Handy Resuscitators are in use today by leading rescue squads, industrial plants, hospitals and other key organizations requiring the ultimate in dependable, mechanical artificial respiration. This tremendous acceptance since 1954, of an entirely new resuscitator, is just one indication of The Handy Resuscitator's valuable contribution to first-aid.

The new Handy Resuscitator mechanism is a revolutionary invention offering versatility never before available in a resuscitator. It is compact, durable and weighs only 7½ ounces. It can be completely sterilized after use, and will tolerate 240° of temperature in a pressure sterilizer or boiling water for 20 minutes. • Some of the models of The Handy Resuscitator will float in water with both oxygen tanks in place. The entire instrument, including the rugged aluminum alloy heavy-duty carrying case, is unique and worthy of careful consideration and comparison in selecting this important type of equipment for your organization. Write for complete details.

ALL-PURPOSE STANDARD PORTABLE MODEL

Lightweight and compact... The Handy Resuscitator meets the rigid standards of the Medical Profession for proper resuscitation. It is engineered to fill the special requirements for rescue and first-aid services. Automatically administers artificial respiration safely and effectively to adults, children or infants.

Also... First-In, Back Pack, Ambulance and Hospital Models for every need.

STANTON *scientific equipment co., inc.*
P.O. BOX 88 / GLENDALE, CALIFORNIA

ANNOUNCEMENT

The Fyr-Fyter Company of Dayton, Ohio, has been appointed exclusive National Distributor for all Municipal hose manufactured by

H. K. PORTER COMPANY, INC.,
THERMOID DIVISION
(QUAKER WORKS)

Fyr-Fyter's authorized distributor organization—with representatives in each of the fifty states—can NOW furnish the most complete line of quality Municipal fire hose brands in the industry.

See Fyr-Fyter's 40-ft. display of new Fire Department products at the 1961 I.A.F.C. Show in Las Vegas.

Pioneer in city communications—and one of the first men in the country to use Leece-Neville alternators, Ben Demby is superintendent of Miami's Division of Communications. Ben is pictured above checking out radio and telephone equipment, just tranferred to his new Plymouth. This equipment includes 4 dual frequency radios, one a Bell Mobile (3 systems are transistorized). Photo center top shows installation in trunk of car. Bottom center photo—Ben checking factory-installed Leece-Neville alternator with L-N factory representative, Jack Young. According to Ben Demby—"Leece-Neville alternators assure better radio life and performance because they provide ample current and constant voltage. By eliminating battery problems, you eliminate radio problems."

Leece-Neville Alternators keep communications loud and clear for the City of Miami

At the same time, L-N alternators eliminate dead batteries, reduce service calls, and cut maintenance costs

On call 24 hours a day for 6 years, this Miami Fire Department Rescue Unit is equipped with 3 radio units, sirens and lights. The Leece-Neville alternator on this truck was installed at the factory before delivery, and has required only one service call in 6 years.

"Battery life doubled... service calls reduced drastically... better radio transmission . . . practically no alternator maintenance"—this is the record for Leece-Neville alternators on City of Miami police cars, according to Roland Joynes, superintendent of the Miami Motor Pool.

The City of Miami was one of the first to use Leece-Neville alternators in municipal service. That was in 1945. Today this popular vacation city has more than 120 Leece-Neville alternators in service, including new corrosion-resistant L-N alternators specified and factory-installed on 44 new Plymouths for police, fire and communications duty. City officials report that Leece-Neville alternators assure peak radio performance, eliminate dead batteries and reduce maintenance costs. For details on how Leece-Neville alternators can help cut costs in your operations, just mail the coupon at the right.

Specify Leece-Neville alternator systems as factory-installed special equipment on new vehicles.

QUALITY ELECTRICAL EQUIPMENT
Leece-Neville
SINCE 1909

The Leece-Neville Co.
Dept. FE-9
1374 East 51st Street
Cleveland 3, Ohio

Please send me complete information about alternator systems and other products for my type of service.

Name _____ *Title* _____

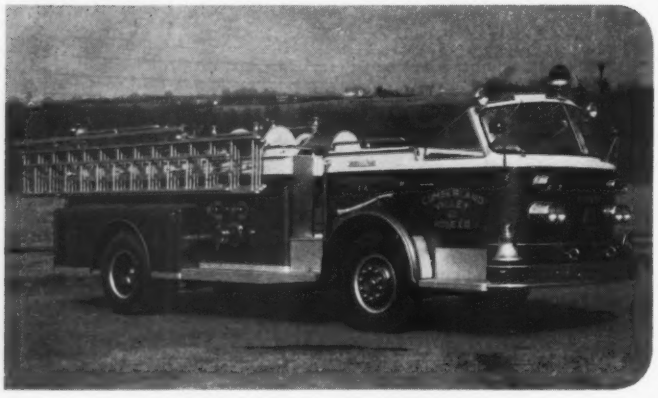
Firm or Dept. _____

Address _____

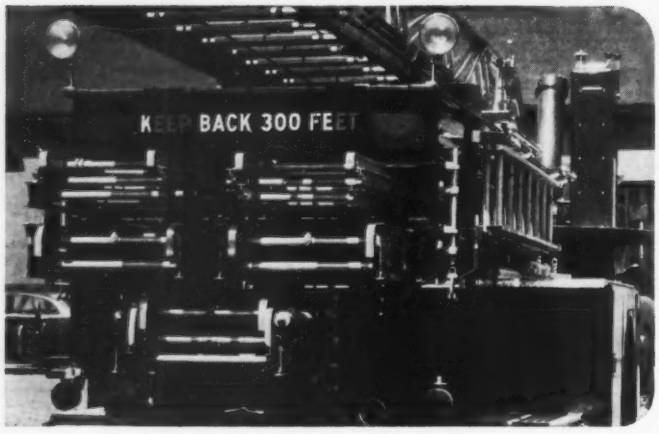
City _____ *Zone* ____ *State* ____

Type of Service _____

An Alco-Lite 14′ Pumper Roof Ladder and 24′ Pumper Extension Ladder on a 900 Series American LaFrance Pumper.



An Alco-Lite 14′ Pumper Roof Ladder and 35′ Pumper Extension Ladder on a 900 Series American LaFrance Pumper.



This typical nesting of Alco-Lite Ladders on American LaFrance Aerials includes a 24′ Pumper Extension Ladder, 20′ Straight Ladder; 35′ Heavy Duty Extension Ladder, 28′ Pumper Extension Ladder; 16′ Pumper Roof Ladder, 35′ Heavy Duty Extension Ladder, and 50′ Heavy Duty 3 Section Extension Ladder.

Original Manufacturer of Aluminum Ladders

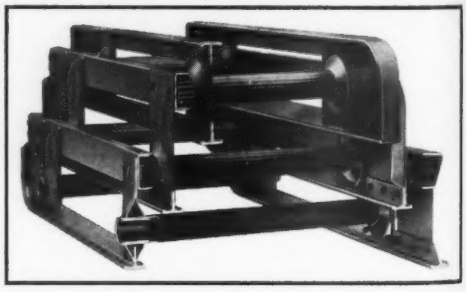
ALCO-LITE

aluminum ladders are standard equipment on these trucks

Alco-Lite Aluminum Ground Ladders are lighter weight . . . easier-to-handle . . . safe. Exclusive gusset plate, expansion bushing construction makes possible the open side rail,T-channel design. Excess weight adding bulk in the side rails is eliminated. More than meet all current tests for strength and safety.

Alco-Lite Aluminum Ladders are unaffected by moisture, water, fumes, gases. Won't warp, rust, rot, splinter, or burn. Almost maintenance free!

Rungs won't twist, turn, or break off. Feature non-slip typo corrugations.



Channel slides prevent sections from disengaging. On large ladders, automatic spring loaded locks allow sections to extend, lock, and unlock simultaneously.

Aluminum Ladder Company **ALCO-LITE**

FLORENCE S. CAROLINA

NEW 76 PAGE
FIRE PROTECTION EQUIPMENT
CATALOG

Chances are you haven't seen this big, new catalog yet—but if fire protection equipment is under your supervision, we're certain you will want a copy on file. Industrial as well as municipal equipment is carefully detailed. Large illustrations, crisp descriptions and fact filled charts for easy reference. Catalog also features—valves, hose house equipment, couplings, expanders, wrenches, cabinets. *Write for your copy today.*

Booths 100 and 117 I.A.F.C.

ELKHART BRASS MFG. CO., INC.
Elkhart, Indiana
More than half a century of fire fighting progress

MAIL COUPON TODAY

ELKHART BRASS MFG. CO., INC., ELKHART, IND.
Be sure to send Elkhart's New Catalog J at once:

Attention Of:_____
Firm_____
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City_____ Zone____
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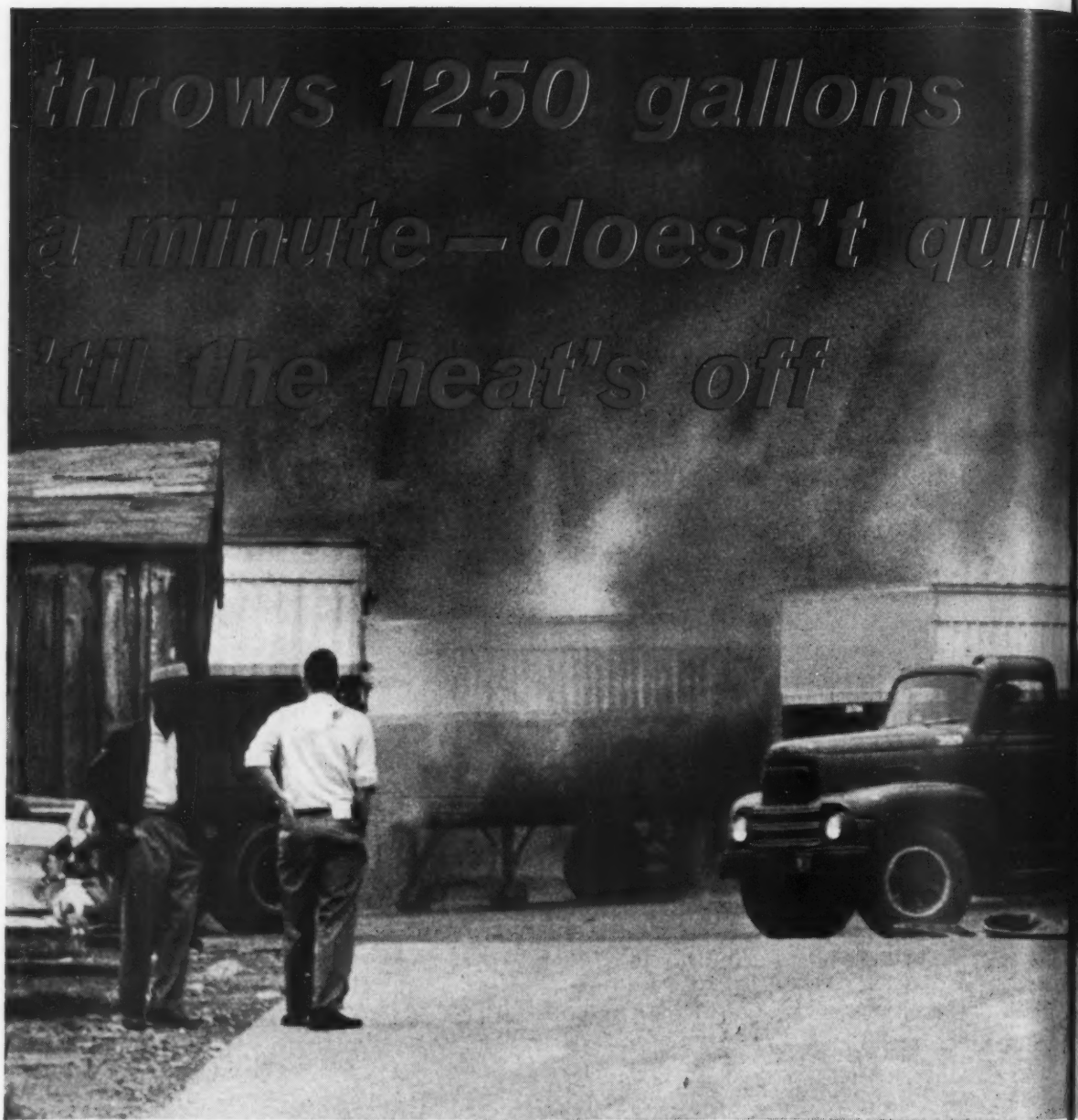


On-the-spot photo, E. St. Louis, Ill., warehouse fire. Courtesy St. Louis Globe-Democrat.

SCOUT—new, fast-striking 13-ft. Fire Truck!

Only 68-in. high, 68-in. wide, on a 100-in. wheelbase, the tough, lean all-purpose SCOUT can get in, get out, turn, park and maneuver almost anywhere. With all-wheel-drive and powered by a rugged, 93 hp., 4-cyl. COMANCHE engine by INTERNATIONAL, it travels at highway speeds or takes off across country. Ideal where heavy equipment is impractical, such as brush or automobile fires or fires on limited-access highways. Equipment includes water tank, pumper or fogger and other supporting auxiliary equipment you would need, like axes, shovels, brooms or respirators. See your INTERNATIONAL SCOUT Dealer or Branch. International Harvester Company, Chicago.

INTERNATIONAL model V-206 answered the bell here...just one in the broadest range of light and heavy duty fire truck chassis in the industry

No town, department or fire is *too small or too big* for INTERNATIONAL fire truck chassis. Production line priced but fire truck designed, the wide INTERNATIONAL range offers you GVW ratings all the way up to 33,000 lbs.

These chassis are backed by a power selection so broad it includes *six V-8 engines alone*, from 155 to 257 hp., with pumping capacities to 1250 GPM. Bolstering this is a wide choice of "6's" that pack from 154 to 212 hp. This lets you custom-fit engine and chassis to your exact needs.

Optional equipment? A wide selection of axles, transmissions, cabs and electrical systems tailors INTERNATIONAL chassis to whatever ladder, hose or pumping apparatus you prefer for your operation.

INTERNATIONAL dual-ignition systems guarantee sure-fire starts. On V-8 engine models V-461 and V-549, both sets of plugs can be fired simultaneously (or each set individually) by simply turning a switch.

INTERNATIONAL® TRUCKS WORLD'S MOST COMPLETE LINE IH®

WHEN THE GOING GETS HOT

you want the PROTECTION only a GLOBE SUIT can give!

GLOBE DUCK SUIT . . . . .

- Fire retardant, pre-shrunk, water repellent yarns plied, doubled, and twisted for extra strength and cushion
- 100% waterproof, fire-retardant interlining, pliable at temperature extremes; resists deteriorating chemicals and air rot
- Sanforized, lightweight, plaid-flannel lining and/or 100% wool liner
- 5" Hockmeyer water-repellent corduroy collar; adjustable straps to insure tight fit against water, sparks, heat
- 100% wool knit wristers
- Aluminum, non-sparking safety-snap and D-ring fasteners
- 6" no-gap storm flap on coat front

GLOBE ALUMINIZED SUIT . . .

- Reflects away 90% of all radiant heat
- Cuts weight of protective clothing by almost 50%
- 3M Brand aluminized rayon fabric, New Type 82 F689 (10 oz. per yd.) with high stress-tear strength
- Available in Air Force heat-protective type cover coat and pants

STANDARD SINCE 1901

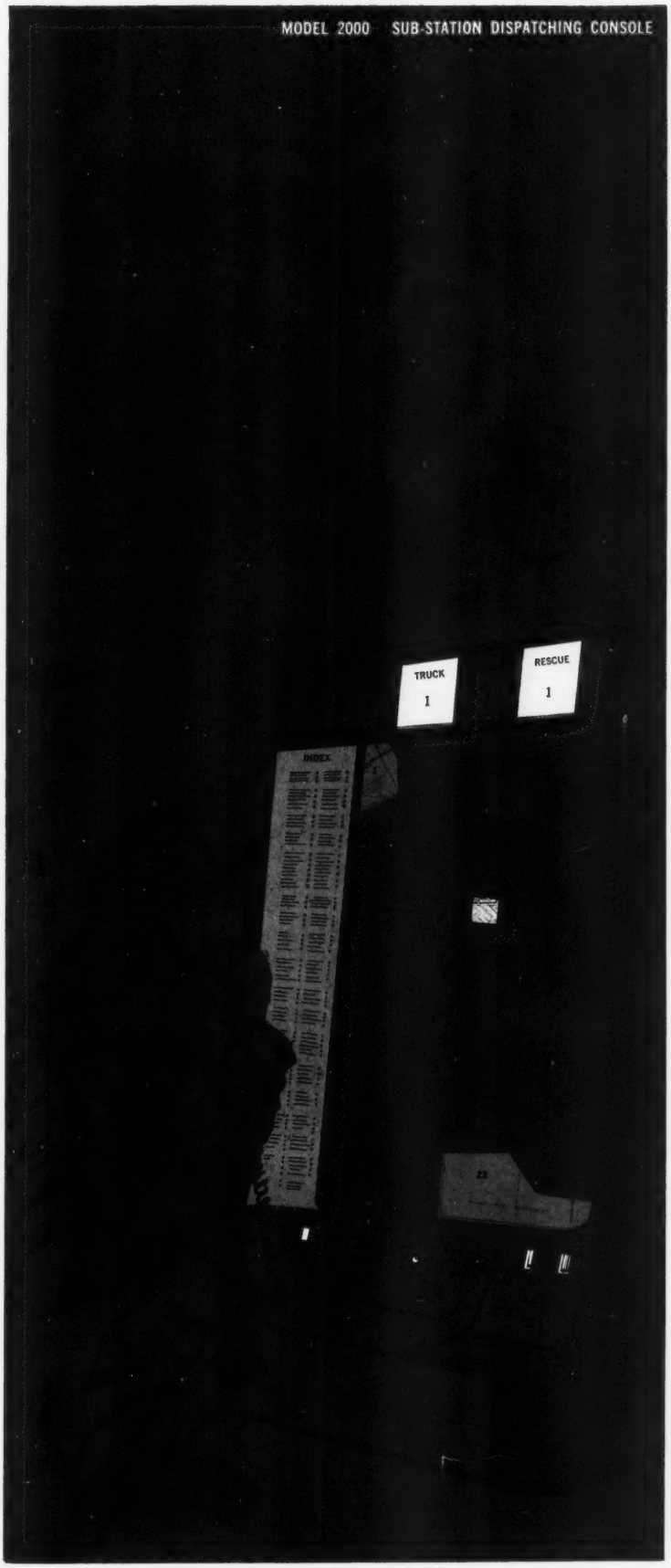
GLOBE

MANUFACTURING COMPANY

PITTSFIELD, NEW HAMPSHIRE

SEE YOUR AUTHORIZED GLOBE DEALER OR WRITE FOR FULLY ILLUSTRATED CATALOG

SEE US AT THE I.A.F.C. CONVENTION, LAS VEGAS, NEV., BOOTH 105



In keeping with the current trend of space age research, Scientific Electro Mechanical Industries offers a dramatic new concept in graphic display dispatching systems.

The MODEL 2000 SUB-STATION DISPATCHING CONSOLE illustrated, not only gives the officer the location, type, time and date of the incident in writing, but shows pictorially the units concerned, the location of the incident, and the closest operating hydrants.

SEMI engineers and technicians have put forth countless hours in developing display systems for agencies under military and federal supervision, and the progress of this research is now available to the civilian dispatching field thru SEMI "STATUS-MASTER[T] VISUAL DISPLAY DISPATCHING SYSTEMS." Each system is tailor made to the individual requirements of the customer. Our Field/Survey Engineers are available on request, and from their reports a system proposal will be prepared and forwarded to the individual concerned.

SEMI SYSTEMS are also available for POLICE - AMBULANCE - HARBOR - AIRPORT - TRANSPORTATION and INDUSTRIAL application. FOR FULL PARTICULARS WIRE OR WRITE.

SEMI
A SUBSIDIARY OF

NATIONAL ELECTRODYNAMICS CORP.
2910 Nebraska Avenue, Santa Monica, EXbrook 5-1717

Let's face it men -

If it is built better, it should cost more.

If it is built better it costs more to build.

This 1000 gallon Class "A" Triple Combination Pumper was delivered to Elsmere Fire Dist., Elsmere, New York. Dollar for dollar, this truck has no equal. Right down to the last detail, the quality in this truck defies comparison. Rugged, beautifully balanced, built to last.

This is the FAMOUS PITMAN SNORKEL adapted for the fire service. This is the very finest. Full complement of ground ladders (212 feet), built to UNDERWRITERS STANDARDS with dozens of *PLUS* features. In New York State, the Northern Half of Pennsylvania, Massachusetts, Maine, Vermont, Connecticut, New Hampshire and Rhode Island, YOUNG FIRE EQUIPMENT CORP. is the EXCLUSIVE DISTRIBUTOR for this amazing and revolutionary "SNORKEL" . . . Write For Complete Details.

DISTRIBUTOR'S NOTE: There are certain Franchises available.

We proudly use HALE PUMPS exclusively

Young FIRE EQUIPMENT CORP.
1548 William St., Buffalo, N. Y.

molded of MERLON®

POLYCARBONATE

with a diploma from the school of hard knocks

Designing protective headgear is a good way to learn about materials. Take a fireman's helmet, for example, that has to withstand everything a four-alarm disaster can throw at it. What would you make it of?

Starting over a year ago, Mine Safety Appliances Company, specialists in the design and manufacture of protective devices for industry, began the hard-headed investigation that led to the selection of Merlon polycarbonate as the material for their new line of fire and industrial safety headgear.

Reasons? Count 'em: 1) impact and puncture resistance greatly exceeding 40 foot pounds, 2) good dielectric properties, 3) high and low temperature resistance, 4) self-extinguishing qualities, 5) high flexural strength and rigidity, 6) high strength-to-weight ratio. For your needs, add high dimensional stability, transparency, low creep and easy colorability.

These are some of the reasons Merlon is the new quality standard of the high-impact engineering thermoplastics. For complete test data, comparative performance properties or technical assistance, write Mobay Chemical Company, Code 6119, Pittsburgh 5, Pa.

A product of

MOBAY

M-5

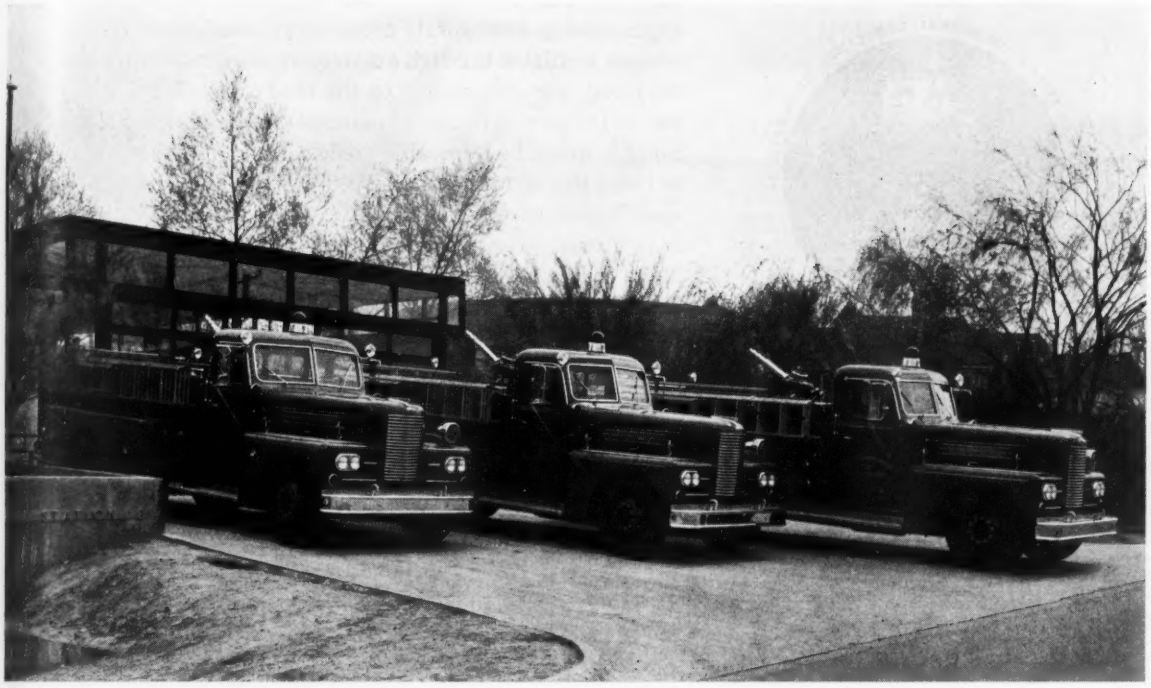
MORE THAN 85% OF ALL SUBURBAN AND RURAL FIRES REQUIRE THE USE OF BOOSTER HOSE LINES. And, firemen know it pays to get these lines into action *fast!* Dependable, efficient, fast action is what you get with Hannay Hose Reels. Hannay Reels are designed by firemen, and built to give top performance on the job, year after year. That's why so many fire chiefs insist on use-tested Hannay Hose Reels on every truck they buy.

Today's fireman moves fast . . . he has to, and Hannay Hose Reels get him moving faster.

REELS BY HANNAY

SUSTAINING MEMBER

CLIFFORD B. HANNAY & SON, INC., WESTERLO, NEW YORK



CEDAR RAPIDS SINCE 1935

Recent addition to the Cedar Rapids Fire Department of three more Pirsch Pumpers, makes a total of ten Pirsch Pumping Engines and three Pirsch Aerial Ladder Trucks now serving this progressive Iowa city, which has been a continuous user of Pirsch apparatus since 1935.

The cut above shows the new Pirsch Pumpers in front of one of the new, modern Cedar Rapids fire stations.

The Pirsch Custom Pumper is a rugged, sturdy, dependable first line fire engine; a true product of experience, it is built in many sizes with a wide range of engines from which to choose the proper combination of capacity and power for your specific local conditions and requirements.

The Pirsch built all-metal Safety Cab is available in several selections and provides real built-in protection for your men against weather and accidents.

Peter Pirsch & Sons Co. KENOSHA, WIS.

The 1961 S&S Professional Cadillac Ambulance is precision engineered to incorporate every service and comfort feature available through automotive science *and* deliver the finest ease-of-handling on the road today. We challenge you to tell us where this ambulance can be improved! Since it would be impossible to detail every feature even in twice this space, we invite you to write for complete specification sheets. Then you tell us if there is a feature we have missed — or if you agree that the 1961 S&S Ambulance is the finest professional rescue equipment you have ever seen. The Hess & Eisenhardt Company, Cincinnati 42, Ohio.

Is there a feature missing

in this
1961 S&S Professional
Cadillac Ambulance
?

Storage? An S&S has more compartments than ever and not one of them interferes with the largest working area in the industry. And here is the only left-hinged door for convenient curbside loading. Here, also, is a hint of the sculptured-in-steel rear design that is distinctively S&S.

Emergency? Here is big, 5-patients-and-attendant capacity; and a new standard of comfort in the floor length, even-distribution heating system, an S&S exclusive. Here is new convenience with the exclusive S&S Automatic Locking Cot Fastener that does not require moving a hand from the cot.

From the timeless beauty of sculptured styling to the smallest interior detail, an S&S ambulance is the product of 85 years of advanced engineering and dedicated craftsmanship. Only S&S gives you the stability and safety of body-and-chassis "Monotized Construction."

the tradition of leadership... S&S

NEW ENAMELED

Fire BADGES & INSIGNIA

SOLD ONLY THROUGH AUTHORIZED BLACKINTON REPRESENTATIVES

IMMEDIATE RECOGNITION OF RANK AND RESPONSIBILITY IS NOW POSSIBLE WITH THIS DRAMATIC NEW LINE OF COLORFULLY ENAMELED FIRE BADGES. "COLOR CODE" EVERY MAN IN YOUR DEPARTMENT BY ASSIGNING INDIVIDUAL COLORS FOR CHIEF, RESCUE SERVICE, RADIOLOGICAL SPECIALIST, ETC. YOUR UNIFORM SUPPLIER HAS COMPLETE DETAILS.

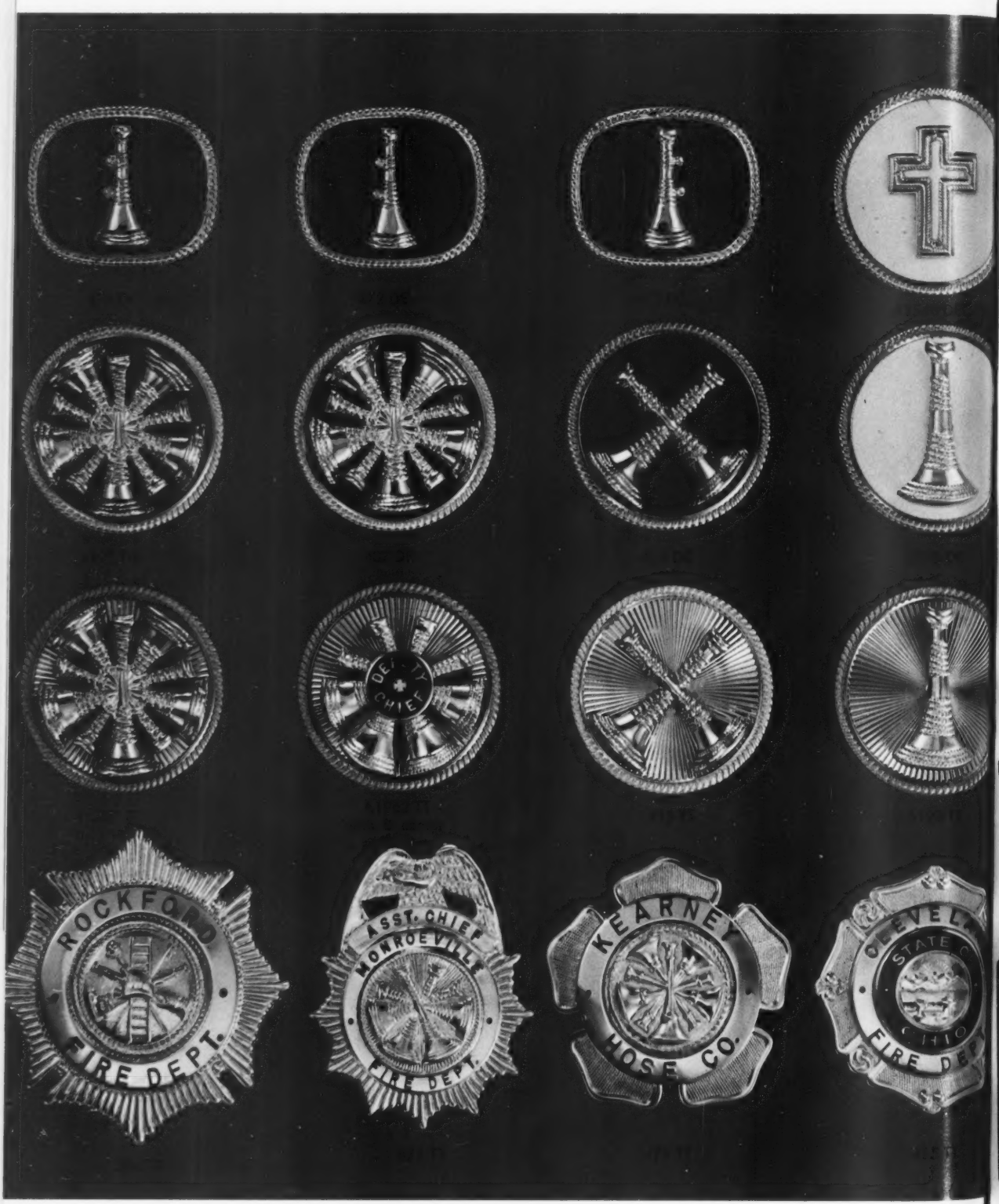
BEFORE YOU MAKE YOUR NEXT BADGE PURCHASE ASK TO SEE THESE HANDSOME NEW ADDITIONS TO AMERICA'S FINEST BADGE LINE.

V. H. BLACKINTON & CO., INC., ATTLEBORO FALLS, MASS.

BLACKINTON

Fire BADGES & INSIGNIA

AN EXCLUSIVE SELECTION OF BEAUTIFULLY ENAMELED FIRE INSIGNIA AND BADGES INTRODUCED FOR THE FIRST TIME BY BLACKINTON, THE COUNTRY'S OLDEST BADGE MANUFACTURER.

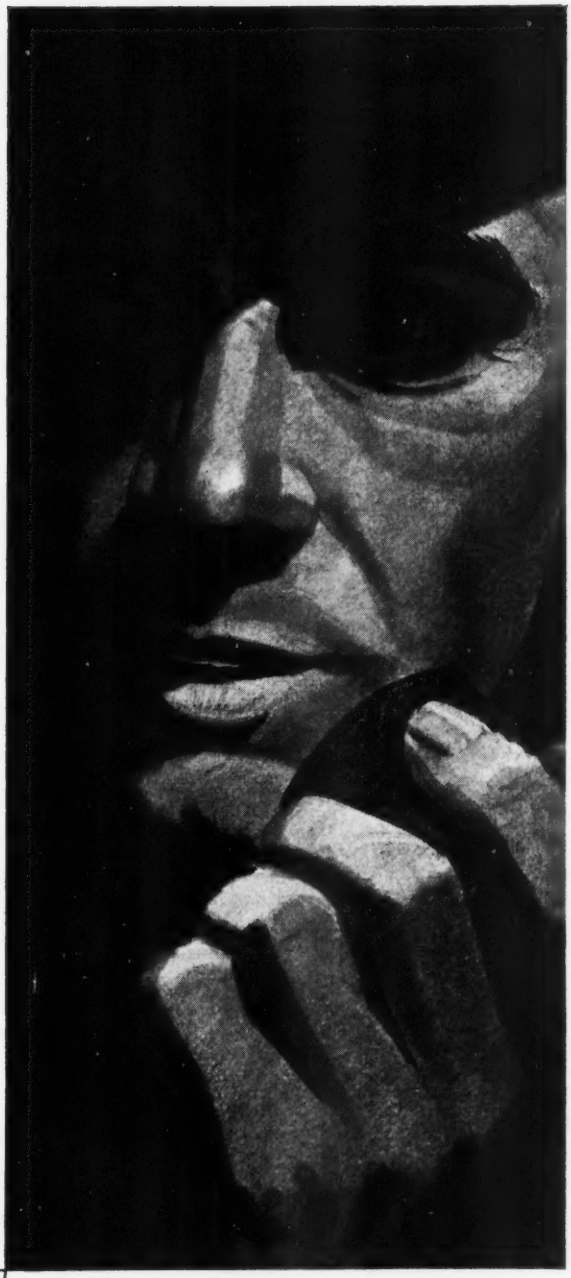


LIMITED SPACE PERMITS US TO SHOW ONLY A FEW OF THE MANY INSIGNIA STYLES AVAILABLE. PLEASE ASK YOUR UNIFORM SUPPLIER FOR COMPLETE DETAILS ON THIS ALL-NEW LINE OF ENAMELED FIRE INSIGNIA AND BADGES.

BLACKINTON ... YOUR BEST BADGE BU

V. H. BLACKINTON & CO., INC., ATTLEBORO FALLS, MASS.

Fully **TRANSISTORIZED** receiver adds more benefits to Motorola **"HANDIE-TALKIE"**® radiophone



Advanced engineering features in the new Motorola "Handie-Talkie" Radiophone pay off through increased reliability, unmatched performance and greatest economy of operation.

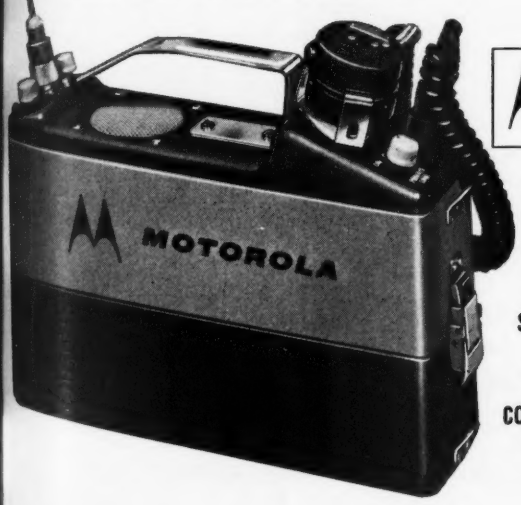
RELIABILITY is greatly increased through the extensive use of transistors—designed to last the life of the radio. Transistors are soldered securely to the chassis. They can't loosen or develop bad contact points even during the roughest use. The unit is "there and operating" when you want it and need it most!

PERFORMANCE is far superior to any other portable of its type. Here is "big set" performance in the compactness you demand in a portable. Greater receiver sensitivity means clearer message reception—greater range into fringe areas. Power output up to 8 watts is available for extended range operations.

ECONOMY of operation is greatly improved. The fully transistorized receiver drastically cuts battery drain... greatly extends battery life... stretches your battery dollar.

There's a "Handie-Talkie" radiophone to fill your needs. Contact your nearby Motorola Communications Representative today for full details and a "Handie-Talkie" radiophone demonstration. Or fill in and mail the coupon for complete fact kit on how this unit can give you better performance and save you money.

"Handie-Talkie" is a trademark of Motorola Inc.



MOTOROLA

GET THE FULL STORY MAIL THIS COUPON NOW!

Motorola Communications & Electronics, Inc.
4501 Augusta Blvd., Chicago 51, Ill., A Subsidiary of Motorola Inc.
Dept. AFE 136

☐ Send me complete information on Motorola "Handie-Talkie" Radiophone
☐ Have representative phone for appointment

Name _____ Title _____
Company _____
Address _____ Phone _____
City _____ Zone _____ State _____

An important message for Fire Chiefs...

WHEN SECONDS COUNT, SPEED HELP WITH NEW BELL ***GROUP ALERTING*** *AND* ***EMERGENCY REPORTING*** *SYSTEMS!*

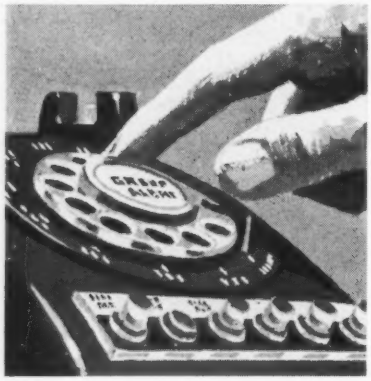
In a fire, or any emergency, even short delays can cost lives and property. That's why Bell Telephone System research has developed two unique types of communications that save time, get needed men and equipment to the scene—right away.

The GROUP ALERTING AND DISPATCHING SYSTEM was developed especially for communities with volunteer fire departments. With one spin of a headquarter's telephone dial, many volunteers are called simultaneously, receive recorded instructions, are on their way.

The EMERGENCY REPORTING SYSTEM provides instant street to headquarters contact. Headquarters gets quick answers to the vital questions, *what* and *where?* Men and equipment are dispatched immediately, without confusion.

Right now communities throughout the country are adopting these new systems. Here's why . . .

GROUP ALERTING AND DISPATCHING



Alerts volunteers fast. One spin of dispatching telephone dial and men needed are called with distinctive ring on each man's regular telephone at home or at work.

Speeds action. Dispatcher repeats message once, hangs up. His words are recorded, exact message reaches all volunteers. Recording continues five minutes, may be extended.

Reduces cost. Group Alerting service is flexible. Alerts only the men that are needed.

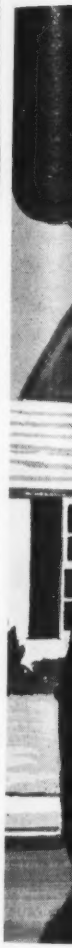
Improves traffic control. Private telephone-alerts mean less traffic congestion. Chances of accidents that can happen when curiosity seekers get in the way of emergency equipment are minimized.

Eliminates capital investment. Service depends largely on existing telephone networks. Equipment provided by Telephone Company. After nominal installation charge, only cost is monthly service charge.

Adapts easily for use by civil defense units, rescue squads and police departments.

Assures you of reliable operation. All equipment installed, maintained and regularly checked by skilled Telephone Company technicians.

For full details, call your nearest Bell Telephone business office. Ask for a Communications Consultant and he will give you the whole story.



EMERG
SYSTEM

Visit our ex

EMERGENCY REPORTING SYSTEM

Saves time. Citizen calls control center from nearest street phone, reports exact location, nature of emergency. Phones strategically placed throughout city.

Reduces false alarms. In cities where Emergency Reporting is used, false alarm frequency has dropped significantly.

Cuts waste of manpower and equipment. Nature, extent of emergency known immediately. Duplicate dispatching eliminated, even if several persons report same emergency.

Provides printed records. Calls recorded on automatic equipment that prints time, date, call box number.

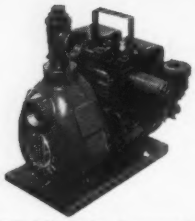
Doubles as police call box. Police headquarters reached, bypassing emergency switchboard. Service is flexible, too. Reporting stations, dispatching circuits rearranged fast to meet changing conditions.

Eliminates costly upkeep. Regular Bell System monthly service charge covers all repairs and maintenance.

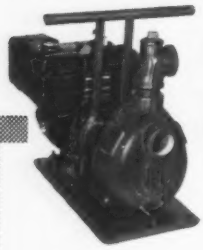
Assures you of continuing operation. Circuits continuously self-tested. Alarms notify control center of interruption to service. Telephone Company personnel are quickly sent to trace, repair trouble.

BELL TELEPHONE SYSTEM

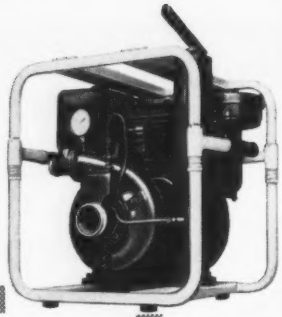
Visit our exhibit and play "Fire Ringo" at the International Association of Fire Chiefs' Convention, Convention Hall, Las Vegas, September 24-28.



The 25-T "Torrent"—A self-priming, portable pumping unit for "mopping up" operations and general "good-will" use by Fire Companies. Pumps 10,000 GPH.

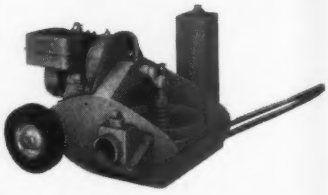


The 20-T "Torrent"—A compact, rugged, lightweight unit, easily carried by one man. Pumps 8,000 GPH. Pump of a "1000 uses" in building good will for Fire Companies.



Type FZZ portable fire-pumping unit—Packs a pressure punch. Lightweight, yet pumps 60 GPM at 90 lbs. on 10 ft. actual lift. Protective wrap-around frame with fold-away carrying handles.

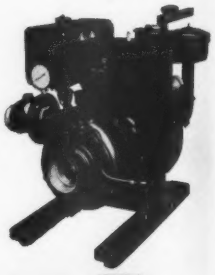
Type 20-DP Diaphragm Pump—A 3500 GPH pump designed for handling muck or silt, with easy maintenance and low-cost operation.



NOW You Can Pick The Pump

that serves your purpose best from the HALE Complete Line of FIRE PUMPING UNITS

Type FZ portable fire-pumping unit—Packs a volume punch. Available on skids or in protective wrap-around frame. Pumps up to 300 GPM at 18 lbs. on 10 ft. actual lift.

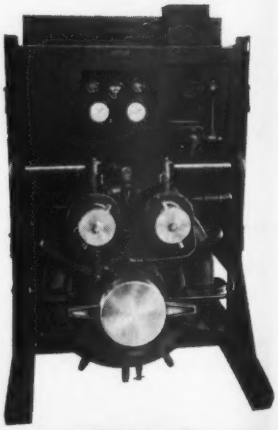


No matter what your pumping needs are, there's a HALE pump to do the job *and do it right*. Hale fire pumps can be found on anything from the powerful pumpers in the country's largest cities to fire-fighting jeeps in the back woods. Every type of Hale fire pump is custom designed for a specific fire use. Because of this, every Hale pump will give you RELIABILITY plus better service, efficiency, and long wear with less maintenance cost.

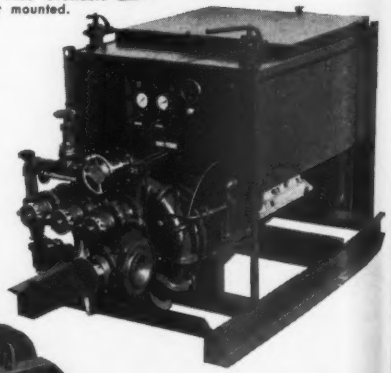
Write today for information on the Hale pump that will serve your purpose best! Write to Dept. F. E.

HALE FIRE PUMP COMPANY
CONSHOHOCKEN, PENNSYLVANIA

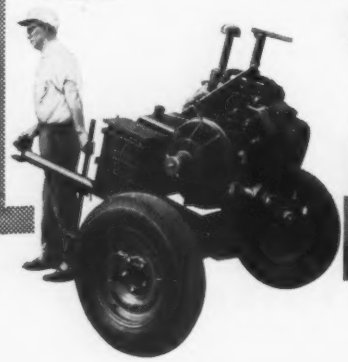
Type CFS — Skid mounted; pumps 500 GPM at 150 lbs. (Class A rating). Also available mounted on trailer.



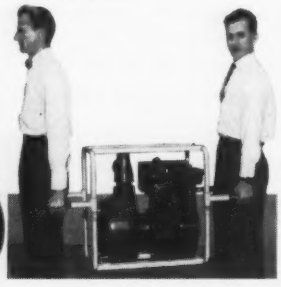
Type CLFV—A RUGGED, POWERFUL Unit. Pumps 750 GPM at 150 lbs. (Class A rating) with ample reserve. Also available trailer mounted.

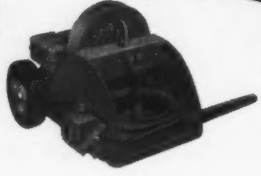


Type WF—Designed for forestry service, municipal and industrial fire protection, and general utility pumping. Skid or trailer mounted. Pumps up to 150 GPM at 100 lbs.



The 30-T "Torrent"—All-around use for moving high volumes of water fast. Pumps up to 20,000 GPH. Shown here in protective wrap-around, two-man carrying frame.

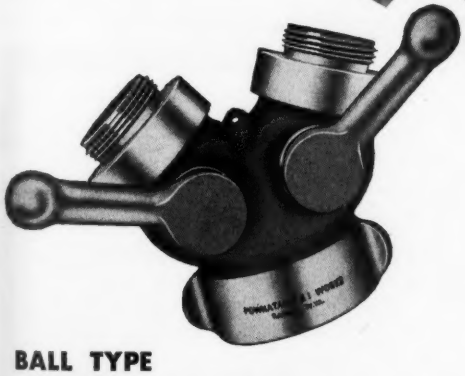




Type 15-DP 1½" Diaphragm Pump—A low-cost, portable pump designed for positive handling of seepage and high-solid-content water. Pumps up to 3000 GPH. A "good-will" ambassador.

DURA-FOG NOZZLE

SUPER-FORGE COUPLING



BALL TYPE SIAMESE

BALL TYPE VALVE

POWhatan BRASS GOODS

are available wherever you are . . . Through your local dealer—or overnight air express direct from us.

DURA-FOG NOZZLE the sweetest little fog nozzle you've ever used. Exceptionally fine dispersion with less water. Every one factory tested and guaranteed, 100% performance or your money back.

SUPER-FORGE COUPLING
The toughest, tightest, lightest coupling you can buy. Drop forged for rough fire service. Non-corrosive. Comes with 3 "Sensible" lugs on both male and female, with Higbee Indicators.

BALL TYPE SIAMESE 2½" x 1½" x 1½"
Quarter turn gives you full stream—full shut-off, any pressure. Straight-through waterway. Comes with either pin or "Sensible" lug swivel. Red body, with polished brass or chrome trim.

BALL TYPE VALVE
1½ inch and 2½ inch—quick quarter turn for full stream or full shut off. Speeds attack! Built expressly for rugged, exacting fire service.

Specify **POWhatan** Brass Goods

POWHATAN
BRASS & IRON WORKS
RANSON, WEST VIRGINIA

BULLETIN

ST. LOUIS, MO., AUGUST 1961

CENTRAL DOES IT AGAIN!

NEW SCIENTIFIC ADVANCES IN MATERIALS PLUS CENTRAL ENGINEERING GIVE YOU A LIFETIME GUARANTEE ON BOOSTER TANKS! OFFERS YOU THREE BIG REASONS WHY YOU SHOULD CONSIDER CENTRAL EQUIPMENT!

1. NO MORE LEAK PROBLEMS; 2. NO MORE REPLACEMENT PROBLEMS; 3. NEW TANKS INTERCHANGEABLE ON MOST OLD OR NEW CENTRAL MODELS . . .

NORTH LITTLE ROCK SELECTS TWO NEW CENTRAL PUMPERS

6-MAN, TILT-FORWARD CAB ON INTERNATIONAL 250 H.P. CHASSIS. 500 GALLON BOOSTER TANK. 750 G.P.M. WITH WATEROUS ELECTROMATIC PUMP. ALL BALL VALVES AND NON-RUST COPPER TUBING THROUGHOUT.

CHECK WITH CENTRAL FOR ALL YOUR FIRE FIGHTING NEEDS!

LOCAL SERVICING IS A CINCH WITH TILT-FORWARD FEATURE.

See us at the I.A.F.C. CONVENTION in Las Vegas.

CENTRAL FIRE TRUCK CORP.

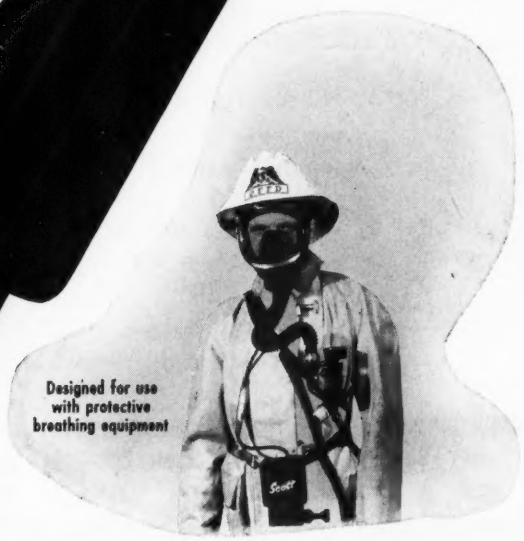
MANCHESTER, MISSOURI

15 MINUTES WEST OF ST. LOUIS ON HIGHWAY 100

ANOTHER SCOTT FIRST

A new, light-weight, compact, powerful speaking device, comprising the most up-to-date electronic components. The ability to communicate clearly while wearing mask equipment makes possible the exchange of needed information and instructions for greater safety. The VOICE-PAK inspires confidence and the increased safety builds morale.

VOICE-PAK operates on inexpensive, pen-light batteries available everywhere. Speaker is protected by a strong, water-resistant, metal case. The complete assembly, including Scottoramic mask with nosecup, can be used with all Scott Air-Paks.



Write for brochure giving complete technical data.

NOW... A POWERFUL VOICE FOR GREATER SAFETY

SCOTT AVIATION CORPORATION

215 ERIE STREET • LANCASTER, NEW YORK

Export: Southern Oxygen Co., 3 West 57th Street, New York 19, N. Y.

Canada: Safety Supply Co., Toronto — Branches in Principal Cities

ARE YOU CERTAIN?

CAN YOU OFFER THE ULTIMATE IN EMERGENCY BREATHING ASSISTANCE TO THE PEOPLE OF YOUR COMMUNITY?

PAY US A VISIT AT BOOTH #3 AT THE I.A.F.C. AT LAS VEGAS AND FIND OUT FOR YOURSELF WHAT THIS ELECTRONIC UNIT CAN OFFER YOU.

1. **NOW—FOR THE FIRST TIME! A device to convert weak, difficult breathing into good strong inspirations; thus assuring an adequate supply of oxygen to the lungs!**
2. **Victims from 20 hours of age to 79 years, have recovered, thanks to the PROMPT use of the VENTILAIDE!**
3. **A unit, that has become a MUST for all fire, rescue groups who take great pride in their effective, modern, life-saving equipment!**

BATRONIC VENTILAIDE

DESIGNED TO ASSIST THE BODY TO BREATHE

Write for complete information to

BATROW LABORATORIES, Branford, Conn.

WHY WYOMING, MICHIGAN BOUGHT ITS SIXTH FWD

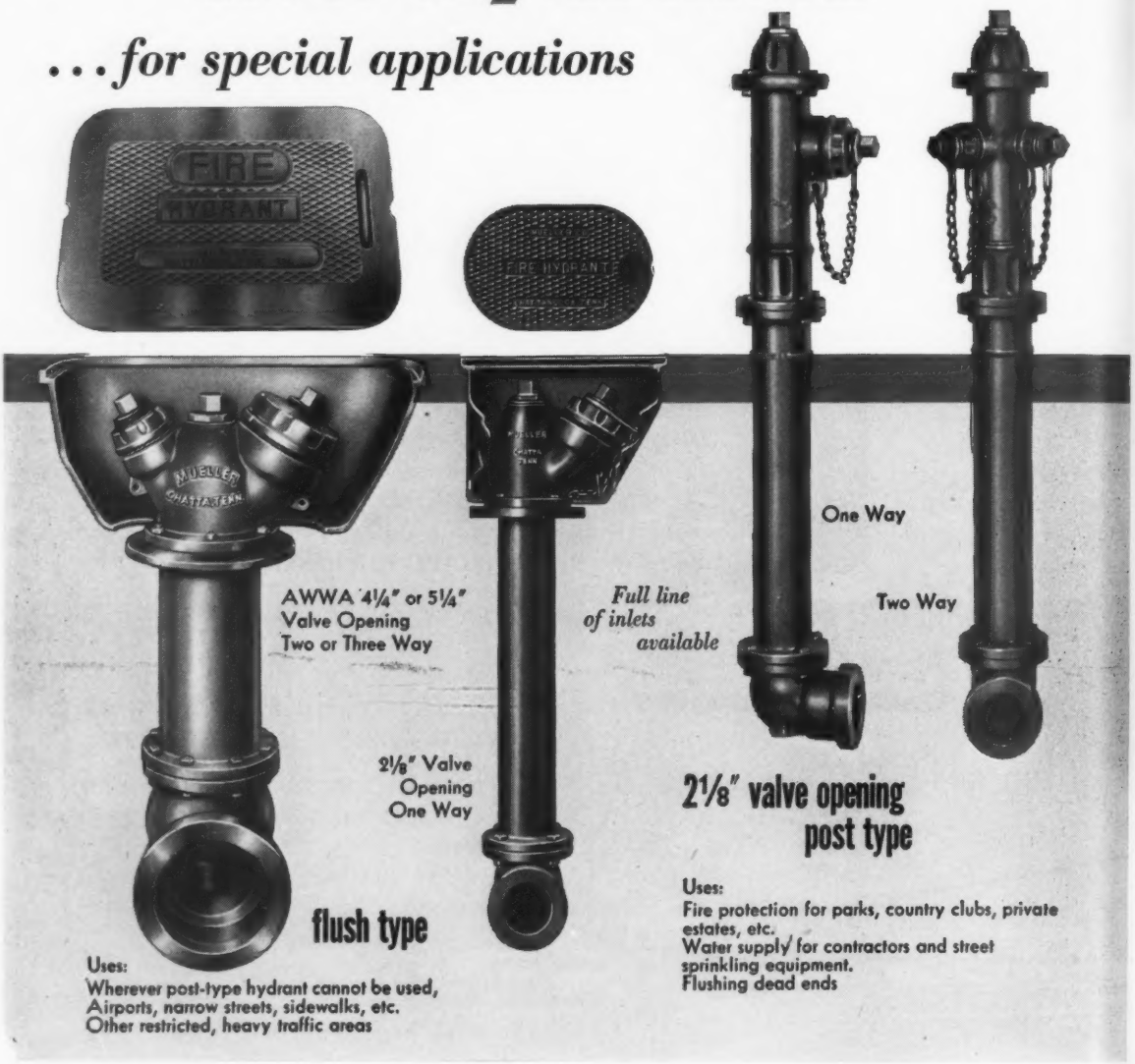
"We consider FWDs the safest trucks we can buy," said Fire Chief Jay L. Waalkes, 27 year veteran of the City of Wyoming Fire Department. And he ought to know! This Michigan city of 49,000 population has 60 volunteer firemen operating out of four stations, with a fifth scheduled for construction next year. Since 1951, when it was a township, the City of Wyoming has bought six pieces of FWD Fire Apparatus. And what a fire fighting fleet it is – triple combination pumpers and its latest FWD addition, the F4-730 Snorkle unit. Chief Waalkes' citizens can rest assured every night – knowing they live in a safe city – protected by the safest fire trucks it can buy. FWD. Designed to deliver fire fighting teams dependably – regardless of weather, terrain or season. FWD CORPORATION • CLINTONVILLE, WISCONSIN • SUBSIDIARIES: FWD WAGNER INC. • PORTLAND, OREGON • FWD (CANADA) LTD. • KITCHENER, ONTARIO.

FWD CORPORATION

MUELLER®

fire hydrants

...*for special applications*



These fire hydrants for special applications are just a part of the full line of fire hydrants produced for municipal, industrial and private fire protection systems by Mueller Co.

The design and quality of these special hydrants is exactly the same as Mueller AWWA Standard Fire Hydrants for municipal use. Compression type main valves, automatic drain valve mechanisms and "O" ring stem seals are just a few of the features. The only difference in the 2⅛" valve opening hydrants is size.

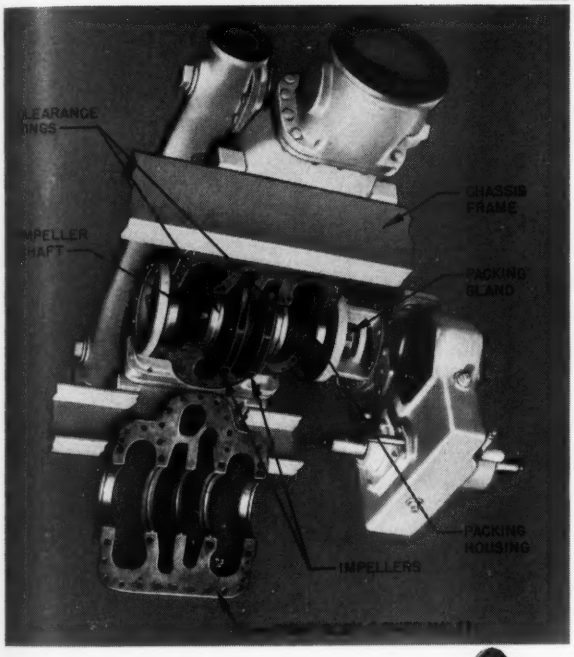
The use of these quality features in *all* Mueller fire hydrants is typical of the great attention to detail in research, design and engineering that becomes a part of every Mueller product made for the water industry.

Write for complete information.

MUELLER CO. **DECATUR, ILL.**

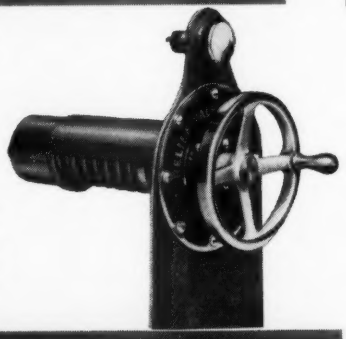
Factories at: Decatur, Chattanooga, Los Angeles;
In Canada: Mueller, Limited, Sarnia, Ontario

Whether It's 2-Stage or Single-Stage
THE INSIDE STORY *Tells Why It Pays to Specify* HALE

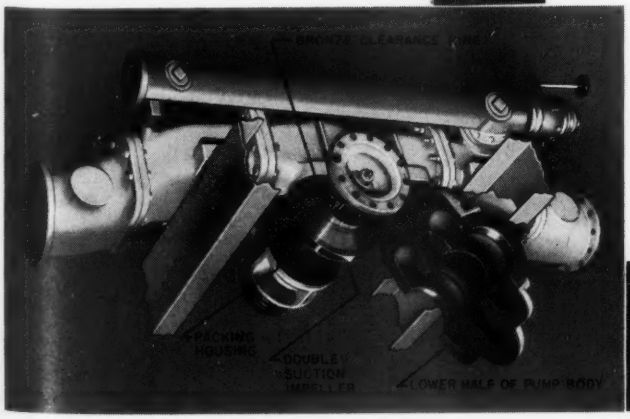


Above — Under-frame view of HALE 2-stage centrifugal pump with priming pump removed.

At right — New simplified relief valve control (panel-mounted) with pilot light setting.



Below — Underside view of single-stage QSM pump. The ONE "double-suction" impeller and its simplicity and ease of operation are two of its many outstanding features.



To satisfy yourself that the fire pump you specify will stand up under long hours of gruelling punishment, you need to know the HIDDEN reasons for enduring quality, efficiency and dependability—the real INSIDE STORY.

That is why we have shown here the "insides" of two typical HALE Pumps—first, the dynamic 2-stage "Q"; and second, the single-stage "QSM" with its ONE "double-suction" IMPELLER that provides tremendous reserve capacity.

No picture can show the complete "character" of a pump. It's not just the OBVIOUSLY IMPORTANT parts—such as Impellers, Shafts, Gears, Discharge Valves, Packing—but ALL parts of Hale Fire Pumps are carefully designed, precision manufactured, rigidly inspected and subjected to rugged performance tests beyond the call of duty.

These are the basic reasons why HALE pumps have won the respect of users all over the world for over 45 years. These are the reasons why more and more Firefighters know that is pays to "Specify HALE FIRE PUMPS."

FOUR BASIC PUMPS

Send for up-to-date Bulletins and get the inside story on Hale's four classes of midship pumps for fire trucks. Check each pump—you can be sure one of these pumps will fulfill your specific needs best. NBFU capacities from 500 to 1500 GPM.

HALE FIRE PUMP COMPANY
CONSHOHOCKEN, PENNSYLVANIA

How de

ow dependable is your fire hose?

Trained firemen don't *mean* to abuse hose. But when life and property may hang in the balance, zealous crews have but one aim: to get the blaze under control. Hose dependability is of utmost importance.

That's why experienced fire chiefs prefer Hewitt *All-Dacron* fire hose. It's one hose that doesn't have to be babied and will still do its job.

How's this for a torture test?

Three pieces of different hose construction were dragged 50 miles behind a car through city streets to test abrasion resistance. The results:

Construction	Outer Jacket	Inner Jacket
A. All-cotton	Worn through	Signs of wear
B. Dacron filler	Worn through	Signs of wear
C. All-Dacron	Slight scuffing	No signs of wear

Advantages:

All-Dacron over all-cotton:

- Three times as strong
- 20% lighter
- 80% less water absorption
- Great flexibility
- Increased acid resistance

For fire hose information consult your H-R representative or write Hewitt-Robins, Stamford, Connecticut. Ask for Bulletin 9-52.

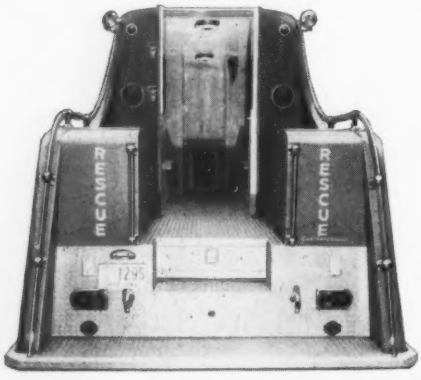
HR HEWITT-ROBINS

Because H-R manufactures all types of municipal and industrial fire hose... it pays to specify Hewitt-Robins.

IS THIS THE STYLE FIRE-RESCUE UNIT YOUR DEPARTMENT NEEDS?

OTHER FEATURES OF INTEREST

Underfloor compartment stores extension ladders. Two-way telephone maintains good communications between driver's cab and rear compartment. Two spot lights front and rear for on-the-spot illumination. Directional signal system and flashing system front and rear for maximum safety. Heavy-gauge aluminum treadplate for durability, safer footing, good appearance. Chrome grab rails and other chrome accessories make this highly functional unit a fine fire department auxiliary. Overall body length—16 feet.



Highly efficient unit for Borough of Folcroft looks the part, too!

In fire-rescue vehicles you don't have to sacrifice good design to make the best use of space. In this case, the Ford C-700 Tilt-Cab Chassis provided the basic lines for the extensive compartmentation Gerstenslager was able to engineer into the rescue body. In 12 separate exterior compartments Folcroft stows a great variety of emergency equipment including a 3500 watt, 110-120 volt generator.

The interior provides ample seating for crew members, well-organized first-aid facilities and stretcher accommodations for four patients. It is well-lighted, well heated and ventilated.

Your department can have an equally effective fire-rescue unit . . . one that is ready for all local emergencies on a moment's notice. The time to start planning is now . . . the way to start is to write for Gerstenslager's helpful planning brochure and check list.

GERSTENSLAGER

THE GERSTENSLAGER COMPANY • WOOSTER, OHIO • PHONE AN 2-2015
CUSTOM BODIES SINCE 1860

MIDWESTERN

Safety Clothing for Firemen

The Original STRIPED SAFETY COAT

The striped safety coat for firemen is an Original Midwestern development—first in the field—a leader ever since its introduction 19 years ago.

The BRILLIANT YELLOW stripes are actually rubberized into the black rubber . . . and exclusive feature that defies comparison with substitute or imitation models where the stripes are glued, sewed or painted on the material.

When working under hazardous conditions in smoke, fog, dust or darkness, firemen deserve the superior quality, design, comfort and safety features offered by the Original Midwestern Safety Coat.

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FIRE
ENGINEERING
THE JOURNAL OF THE FIRE PROTECTION PROFESSION SINCE 1877
VOL. 114, NO. 9 SEPTEMBER, 1961

Support Civil Defense Now

Recently the President of the United States exercised his prerogative to place certain phases of civil defense under the direction of the Department of Defense. In a message to the Congress announcing this move, he indicated his intention to develop an accelerated program and to support it by a larger commitment of Federal participation than in the past. In his message he also stated the Secretary of Defense will be in charge of Federal programs for the protection of the civilian population including that of fire fighting and control.

Prior to the message, many organizations and individuals, including this writer, rightfully expressed strong concern over possible military control of CD functions as being contrary to the best interests and traditions of this country. In his message President Kennedy stated in part, *"I am assigning responsibility for this program to the top civilian authority already responsible for continental defense, the Secretary of Defense. It is important that this function remain civilian, in nature and leadership; and this feature will not be changed."*

With this assurance and faced with a world situation which has taken on a grave aspect, it is necessary that all Americans show their solidarity in support of the civil defense program. Participation on every level is a requisite if this country is to become and remain strong on the home front in the face of threats by our enemies. The fire service as a whole must reassess its position and assets to make certain that it is prepared to shoulder its obligations. This includes making governing officials again aware of its needs if the responsibilities are to be met.

In line with the President's call for increased funds for civil defense, it is timely to suggest the Federal Government take another look at discontinued programs for matching funds allocated for fire apparatus. When this phase was terminated, it was explained that some municipalities had taken advantage of it, merely to replace overage vehicles. That modern fire apparatus and equipment strengthens not only a given community, but also provides the means to fully participate in area and state mutual aid plans, was completely ignored. Certainly those critical of the results couldn't expect the same communities to fully cooperate in today's civil defense fire plans with obsolete and undependable apparatus. The folly of this can be seen by simply recalling the great obsolescence of fire vehicles in our communities during World War II.

At present it is estimated there are about 54,000 pumpers and 10,000 aerial ladders among the more than 100,000 vehicles employed by the fire service. It is further estimated that about 30 per cent of this apparatus is over the 15-year reasonable life span. For the past three years the U. S. Department of Commerce has reported an average of 2,700 major fire vehicles built annually. Based on these figures, it will require seven years to replace apparatus deemed obsolete right now. In the same period nearly 45 per cent of current apparatus will have reached obsolescence. Unless serious efforts are made to arrest this situation, we will find ourselves in the ridiculous position of having advanced one step and fallen back two.

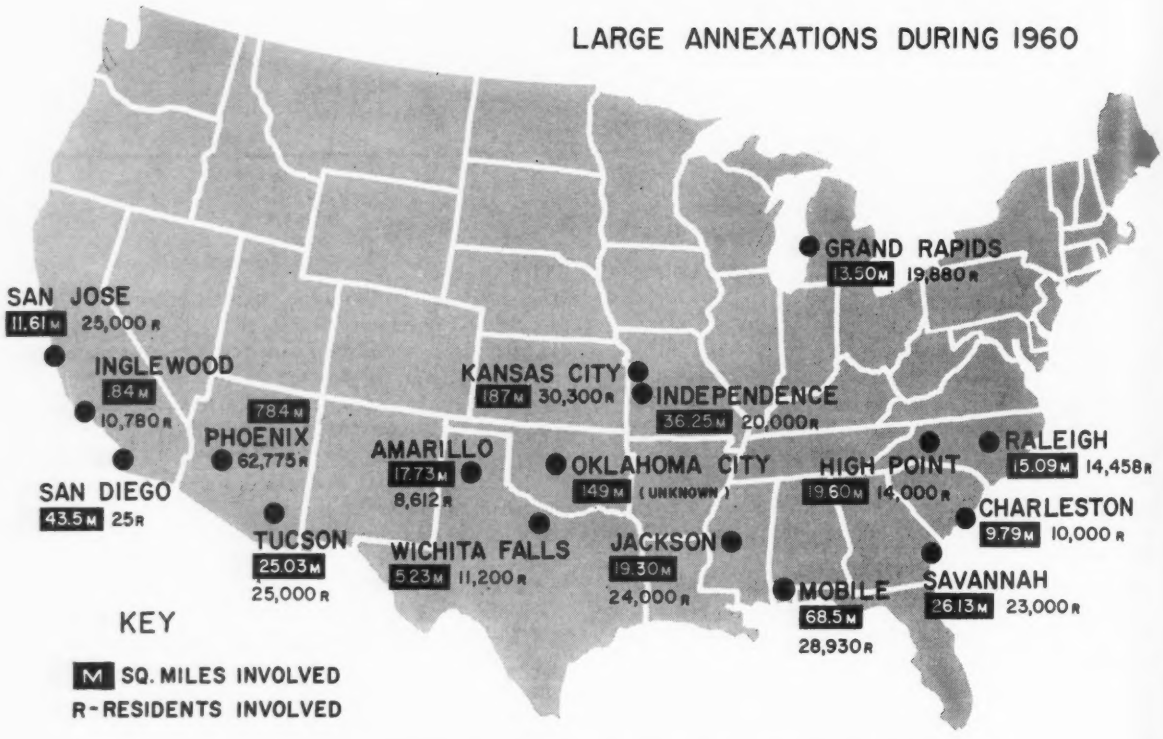
The statistics concern only fire departments now in existence and do not take into account new departments being organized daily. These also require apparatus, thus shrinking the actual replacement rate. Similar parallels can be drawn for many other types of fire fighting tools, equipment and facilities.

On the bright side, the fire service itself has been preparing plans for staff and command training to meet problems created by wartime fire operations. Acting through the National Fire Defense Advisory Committee in cooperation with OCDM, approximately 60 top-ranking fire fighters will attend a two-week pilot command course at OCDM Headquarters in Battle Creek, Mich., during October. Candidates have been invited from among municipal fire departments, Federal Government agencies and state and local fire officers other than municipal.

During the course students will study strategy and tactics of fire defense, fire potentials of nuclear attack, phenomena of fire behavior, progress in fire research, fire service radiological operations, mutual aid agreements and logistics. Results of the pilot course will then be used in developing a basic course that can be adapted to national, state and local needs. Establishment of a National Fire Academy may result.

The President of the United States has sounded a call to action for the preservation of our way of life. As citizens and individuals, all fire fighters certainly will respond to the alarm with every facility at their command. In this respect, no better way can be found than to give wholehearted support to present plans to protect this nation against wartime fires.

Hon O'Brien



(SOURCE - MUNICIPAL YEAR BOOK, 1961, INTERNATIONAL CITY MANAGERS ASSOCIATION)

Growing pains challenge the fire

Annexation, its trials and tribulations, poses numerous fire protection problems as cities expand to meet the needs of millions of new citizens

A STAFF REPORT

AMERICA'S GROWTH is causing difficulties for practically all segments of the fire service. The population of the United States increased from more than 150,000,000 in 1950 to 178,000,000 in 1960. This increase is expected to continue and the Census Bureau of the Department of Commerce predicts that the country's population will reach 202,541,000 by 1970.

Obviously, all these citizens and their property must be protected from fire. The increase in population has caused problems, for example, to the large metropolitan fire departments, to the volunteer departments protecting the growing suburbs adjacent to the large cities, and to the fire districts serving the unincorporated rural areas. It is reasonable to expect that the fire service is going to face these difficulties for some time to come.

Preliminary Reports, Population Summaries, 1960 Census of Population, of the Bureau of the Census present much food for thought. Approximately 85 per cent of the increase in the total population of the United States between 1950 and 1960 occurred in standard metropolitan statistical areas (SMSA's), that is, in cities of 50,000 or more and the outlying areas surrounding them. The 209 SMSA's increased by 22.5 million persons, and of this increase, 17.6 million occurred in the outlying parts of the SMSA's and 4.9 million in the central cities. Thus the population increase in the outlying parts of the SMSA's accounted for about two-thirds of the total population increase of the United States since 1950, and more than three-fourths of the total increase within SMSA's. The growth of population in the central cities accounted for 19 per cent of the total population increase of the United States and 22 per cent of the increase within SMSA's.

The number of cities of 25,000 inhabitants or more rose from 483 in 1950 to 673 in 1960. The number of

cities of 100,000 or more rose from 107 in 1950 to 128 in 1960. Fifty million Americans live in these 128 cities, 3.9 million more than in 1950. Part of the growth in these cities is due to annexations.

For example, Oklahoma City annexed 149 square miles in 1960. Added to the 193 square miles it gained in 1959 and the 88 square miles of the city prior to that date, annexation has permitted the city to grow to 430 square miles. It is now second only to Los Angeles in territorial area.

The Municipal Year Book for 1961, published by the International City Managers' Association, points out that the annexation activity in 1960 broke many records of recent years. More than 700 cities with at least 5,000 population annexed territory, a 16-year record. Approximately 1,083 square miles were annexed.

Why do cities annex?

The suburban areas adjacent to the big cities—the areas which accounted for about two-thirds of the total population increase of the United States since 1950 — become incorporated from time to time by action of the citizens. These incorporations result mostly in what are called "bedroom cities," where people sleep and have their homes, but work in the central city. The large cities view the "bedroom cities" as a threat which will "choke the central city to death." Some municipal officials believe that the incorporation of these smaller bedroom municipalities also splinters the community and mitigates against a well-rounded, integrated, well-balanced community. Many cities regard annexation as the solution to the threat of the satellite cities.

Mayor Bill Duncan of Newport, Ark., points out two other big reasons for annexing territory: The extra turnback from state taxes the added population brings, and helping to make a larger city that will be more attractive to industry.

In some states the laws permit cities to annex adjacent unincorporated areas without a referendum of the residents of the territory to be annexed. In some instances, incorporated areas vote for annexation by the city. Frequently, however, they will reject consolidation in the belief that they can provide adequate services for themselves and that annexation may result in increased taxes.

Volunteer fire fighters in areas to be annexed sometimes oppose consolidation because they are concerned about what will happen to their stations, their equipment and their membership. On the other hand, some real estate developers will petition for annexation to provide city services for their housing developments.

Annexation and its side issues sometimes provide some knotty legal problems and some bitter contests. When the Colorado Supreme Court ruled last year that the 1955 annexation which made University Hills Plaza a part of Denver was illegal, residents of the area sought a legal way to get back into Denver. They are now appealing to the Supreme Court for a rehearing. A leader of the 1955 annexation move said the residents were convinced that they would pay more for less service as a part of Arapahoe County. He predicted the water rate would go up 50 per cent and that taxes and fire insurance rates would rise too. Denver assured the area residents that they would continue to receive police and fire protection and trash collections from Denver until the case was finally settled. Incidentally, a Denver fire station, Engine 24, is across the street. Meanwhile, Denver had collected $300,000 in taxes from the territory during the five years it was annexed.

Montreal, P. Q., earlier this year, sought to have a bill granting it sweeping annexation powers passed by the provincial legislature. Neighboring communities feared that Montreal wished to be free to annex any town with which it has a common border without the then existing necessity of approval by the taxpayers and council of the affected neighbor. Once a neighbor was annexed, Montreal's borders would be automatically stretched to the following town so that it could conceivably "gobble up" every municipality on Montreal Island, if the bill were passed.

Montreal officials claimed that the city incurs a heavy financial burden in providing services to the suburbs. Mayor R. J. P. Dawson of the Town of Mount Royal, on the other hand, said that the suburbs claim that they have always met their full share of the cost of direct services provided by the City of Montreal.

The 32 suburbs on the island told the Quebec legislature that development of metropolitan government is a better answer to the region's problems than Montreal's annexation ideas. The annexation proposals which Montreal finally put before the legislature were much more moderate than had at first been feared. They included a proviso that annexation be decided by a quasi-judicial body. Yet, as a result of the determined opposition of the neighboring municipalities, the bill was withdrawn during the hearings and is to be the subject of further study at a later date.

One of the largest annexation moves occurred recently when Kansas City, Mo., voters approved 186 square miles to be added to the city over a five-year period. A January 1961 annexation added 38 square miles to the southeast area of the city, and this new area is now served by three additional fire stations. Two of these are manned by the Kansas City Fire Department with one pumper company and tender each, and the third station is manned under contract by the Hickman Mills Fire District until January 1, 1962, when Kansas City will operate the station with one pumper company. A ladder company will also be placed at one of the stations in January 1962.

In January 1962, annexation will add 122 square miles in the Kansas City, North, area. It is anticipated that an additional station housing one pumper company will be put into operation in that area on January 1, 1962, and several additional stations will be put into operation as soon as possible to assist the present Kansas City, North, stations in protecting this area. The January 1963 annexa-

Continued on page 881

service

Annexation Statistics 1960

Number of annexations—712

Land area absorbed—1,093 square miles

Communities over 5,000 population annexing more than ¼ square mile by national area:

- Midwest—73
- West—66
- South—58
- Southwest—44
- East—4

(Source — The Municipal Year Book, 1961, International City Managers' Association)

Meet the fire protection problems

By **KENNETH J. CARL**

Director of Municipal Surveys and Assistant Chief Engineer National Board of Fire Underwriters

ONE IMPORTANT responsibility when a municipality annexes surrounding areas is to provide fire protection comparable to that within the former city limits. This usually means that the fire department, fire alarm system and water supply must be expanded and that adequate provisions be made for enforcing existing fire prevention and building codes.

Theoretically, needed additions to existing facilities should be completed and ready to provide service on the official annexation date. Although this "ideal" is seldom attained, some cities have been able to provide a good degree of fire protection as soon as the new areas were officially annexed.

In any annexation discussion, the first question to be answered by municipal officials is: "Are the new areas within reasonable response distances of existing or proposed fire companies?" For good response in residential areas, the distance traveled by engine companies should not exceed 1½ miles for closely built sections. Where buildings are scattered, the distance may be increased up to 3 miles. Ladder company response distances are 2 and 3 miles. For high-value districts, engine company distance should not exceed ¾ mile and ladder companies, 1 mile.

In applying these standards, consideration should be given to future conditions. For example, in areas which now have only scattered buildings, the 3-mile distance can apply. However, if rapid development is likely, the 1½-mile distance should be used.

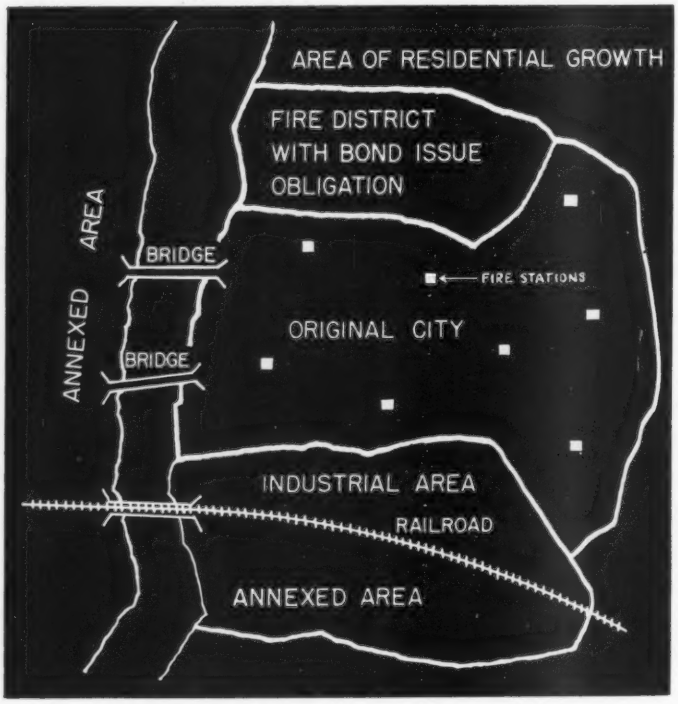
If annexed areas do not extend far beyond the former city limits, it is possible that adequate coverage can be provided by existing city companies. This is not usually the case, however, and as a general rule one or more fire stations are needed in the new portion. It has been possible to use existing stations of volunteer companies, but it is often found that these are not well enough located to fit into an efficient over-all pattern. Another factor is that such stations were erected for volunteer service and may not be suitable for use by paid companies. In several instances volunteer stations have been used temporarily until new stations could be erected.

In determining locations of stations, available sites should be studied from the standpoint of the possible response area. Distances are measured from the site, using the shortest possible routes along regularly traveled streets or highways in all directions on an appropriate map. If the various points established in this way are joined by a line, it will enclose the response area.

In making plots of this type, limitations imposed by thruways, railroads, parks, rivers, bluffs, and other physical features can be readily seen. Some city planners draw a circle on a map using the site as the center and a radius equal to the standard response distance, and consider the response area to be that enclosed by the circle thus formed. This is not correct procedure because it measures travel distance as "the crow flies" and not along actual routes available.

Annexing new territory sometimes gives larger cities an opportunity to study over-all fire station arrangement. In some there may be companies in the "downtown" area that are located too close together. One or more of these may possibly be relocated. This requires a very thorough analysis of the needs of the city as a whole. In moving companies out, care must be taken to continue to provide companies within the standard response distances and to maintain a sufficient concentration to handle multiple alarms in the downtown areas.

If new companies are established,



Hypothetical city and bordering areas show some annexation complications

# of community growth

The author graduated from the Polytechnic Institute of Brooklyn with the degree of Bachelor of Civil Engineering. A registered professional engineer in the Commonwealth of Pennsylvania in 1940, he joined the National Board as an engineer assigned to municipal fire protection surveys. During World War II he was loaned to the U. S. Corps of Engineers as an advisory fire protection engineer. He returned to NBFU in 1945 and was made supervisory engineer responsible for reviewing reports and gradings prepared by field engineers. He became director of municipal surveys in 1957 and was named assistant chief engineer in 1958.

it will be necessary to have additional personnel to properly man them. Communities often make the mistake of providing new stations and apparatus without increasing the fire force. This, of course, is unsatisfactory. In fact, the detailing of men from existing units to man new stations can weaken downtown companies to a point where they may be unable to cope with serious fires. The men needed for new companies should be appointed well in advance of the actual annexation date so that they can receive necessary training. Some cities have employed former members of volunteer companies which provided protection in the area prior to annexation. If such men can qualify, their knowledge of local conditions and hazards should be helpful.

Water supply

Annexed areas need a water system capable of providing adequate quantities for fire fighting. Quite often a city supplies the areas surrounding it with water. It is possible under such circumstances, however, that the fire protection service provided by the water system in the annexed areas may not be comparable to that in the rest of the city so that improvements will be necessary. In cases where a private water company provides service to both the city and the area annexed, the fire protection service furnished by the water company may differ in the city and annexed area because of variations in their respective contracts. The service in the annexed area, therefore, may have to be improved. Some annexed areas will have no public water service at all, making it necessary to extend the municipal system.

If the annexed area has elevations about the same as the adjoining city area, water service can be provided by extending mains. Extensions into new areas of many municipalities consist of single mains along principal highways radiating from the major portion of the distribution system like the spokes of a wheel. The general practice has been to use 6 or 8-inch pipe for such installations. Later when groups of dwellings extending several blocks on either side of the highways are built, the supply for the small gridirons serving these localities is taken from the original single line. It is obvious that such small mains are not adequate, a fact that has been frequently illustrated by fire flow tests. As a general rule, single mains should not be less than 12 inches in diameter. As the spaces between the "spokes" continue to develop, these feeders should be connected by additional mains at least 12 inches in diameter, to supply the gridiron.

For minor distributors in residential areas, 6-inch should be the minimum size, and a considerable proportion should be 8-inch. The layout should be arranged so that mains in parallel streets will have sufficient interconnections to deliver adequate quantities for fire flow and insure reliability in the event of a showdown. Dead ends should be avoided. If not possible, 8-inch mains should be the minimum for dead ends exceeding 500 feet in length.

Schools, hospitals, shopping centers and industrial or other important districts require greater fire flows and the system should be stronger. For such districts the minimum size should be 8-inch, with a good proportion of 12-inch or larger mains. No important district should be dependent upon a single artery or feeder main.

If the new areas are at higher elevations than the rest of the city, it may be necessary to install a booster station and create a "high" service to provide sufficient water for both domestic use and fire protection at suitable pressures. It is generally advisable to provide at least one storage tank on each "high" service. For large services, ground-level storage is also maintained at the booster station to provide a good source of suction supply and to prevent large reductions in pressure on the main distribution service when the pumps are operating.

No matter how reliable a water system may be, if sufficient well-designed hydrants are not installed, good protection will not be provided. Good hydrant distribution in residential areas can be provided by installing one at each street intersection and additional intermediate hydrants so that the distance between them will not exceed 500 feet. In industrial, business and other important areas, where additional hydrants are needed to develop the higher fire flows required, two or more hydrants may be placed at street intersections and intermediate hydrants may be more closely spaced between intersections. Hydrants should be provided with a pumper outlet and one or two 2½-inch outlets and should comply with AWWA standards.

Hydrants are notoriously deficient at most shopping centers in outlying areas. Merchandising methods require in many cases the use of buildings with large undivided areas. In the event of fire they require large quantities of water and present a difficult fire fighting problem. In a study made some time ago, shopping centers were found with only a single hydrant where at least six were needed. It is obvious that to deliver the 3,000 to 6,000 gpm required, one or two hydrants will not be sufficient. If hydrants are spaced about 300 feet apart on all sides of a shopping center, a reasonable degree of protection can usually be provided.

Continued on page 850

Columbus Fire Station 23 houses 750-gpm pumper and 1,600-gallon tanker in strictly residential area. Building is of such beauty it has been mistaken for church by many motorists—Official Columbus F. D. photo by J. Carroll

Columbus Airport Station 25 apparatus lined up on airfield apron. Crash trucks and Jeep turret wagon are solely for airport. A 1,000-gpm pumper also responds to nearby residential area—Official Columbus F. D. photo by J. Carroll

THE CHALLENGE OF ANNEXATION

The Midwest provides its share of headaches and solutions

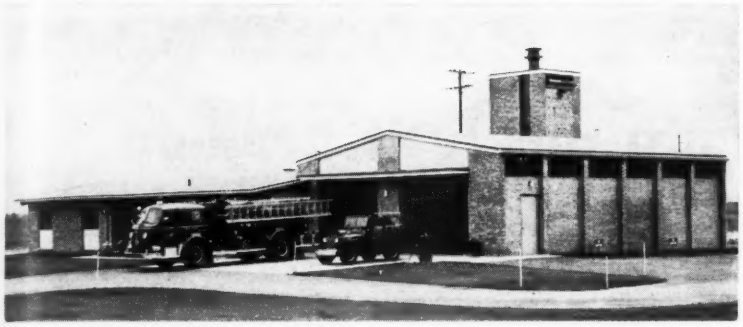
Grand Rapids Scout grass and brush fire truck equipped with 175-gallon booster tank and 90-gpm pump is designed for off-road use to cope with new fire problem brought about by annexation—Photo courtesy International Harvester Co.

By DONALD M. O'BRIEN

ANNEXATION in the Midwest is nothing new, yet all records fell in 1960 when Kansas City added 187 square miles of territory and over 30,000 people. Among many of the other cities active in this area, Independence, Mo., added 36.25 square miles with 20,000 people, and the great city of Chicago took in a minor .27-mile section, with a total of 300 persons. As in other sections of the country, very little adherence to any set pattern is noticed except that the fire service seemed to follow similar steps in providing protection to newly acquired areas.

Columbus, Ohio

The City of Columbus, has a long history of expansion. In the past 10 years it has more than doubled a 40-square-mile area existing in 1950 to its present 90 square miles. Further expansion is expected in the future,



Grand Rapids' magnificent Station 13 houses a crew of 10 men in an area which is, at present, mainly rural-residential. The wing on left was formerly the ranch-type apartment of the previous department chief

This new Grand Rapids Station 15 houses a 1,000-gpm pumper in a rural residential area. The station is manned by a call force made up of 14 members of the volunteer department which originally protected the area

although resistance to territorial increase is mounting in some areas.

In one area which was annexed, but where feelings against becoming part of the city waxed keen, Columbus hired three members of the former fire department. This turned out to have an excellent psychological effect and has served to keep continued agitation against a "fait accompli" in check.

The manpower problem has created some difficulties, though practically all have been settled to the satisfaction of those concerned. During recent annexations three paid fire chiefs became members of the department with the rank of fire fighter. In each instance the men received higher salaries than previously.

Maintaining fire protection

During negotiations to solve the knotty problems of fire districts which were only partially affected, the Franklin County Commission ruled the city could not take over all fire department equipment of a given area unless the entire district was afforded protection. In one instance, Hanford retained one pumper of the Marion Township Fire Department for this purpose. Shortly the entire area was annexed and the pumper was turned over to the city.

In some annexed areas which were formerly protected by outside fire departments, the city council permitted the director of public safety to contract with township fire departments for primary response. At present, Hamilton, Madison and Truro township fire departments and the Village of Whitehall are notified by the Columbus dispatcher and respond to fire calls in areas closer to them than city companies. All are part-paid and volunteer units and they receive a fee set by the State of Ohio.

Water supply

Chief Walter G. Strickfaden has had to add four tank trucks to the department equipment roster in order to provide water in areas without mains. One of these vehicles is also equipped with foam proportioning equipment and ground sweeps for industrial and aircraft use.

Marion Township had a water system in about 50 per cent of the town and the city is adding to it. In all, the city has added over 3,000 hydrants to the water system in the past 10 years and today these total 7,661. All are maintained by the fire department which is also standardizing the entire system as some of the annexed areas had nonstandard equipment.

Public relations

Whenever the City of Columbus has annexed an area, the residents have received a letter from the mayor welcoming them as citizens of the community. Included is an announcement of the fire department service and the proper phone number to call in case of emergency. The mayor also has requested each resident to place conspicuous street numbers on their homes so that the fire department can spot them quickly.

This letter is distributed by the district chief of the area who then obtains the names of the homeowners, the correct address and whether or not they have a phone and the number. In this manner the chief becomes acquainted with his territory and gets to meet the people in it.

Fire stations and apparatus

Columbus built one new station in 1960 and two in 1959 to provide quarters for companies in annexed

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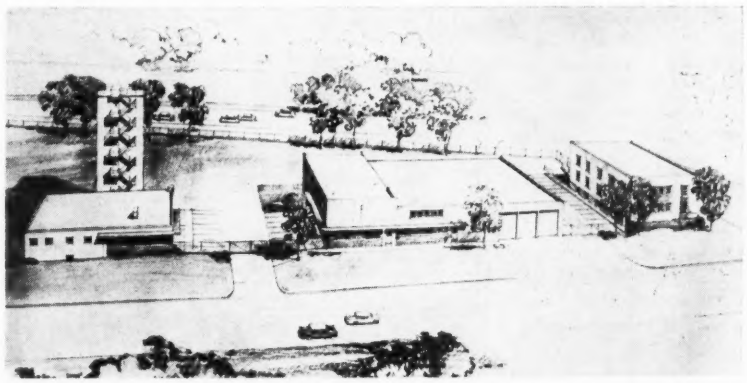


Columbus complex now under construction will include training center and drill tower (left); communications building (center) and administration building (right). Design by Architect Walter E. Pettit includes facilities for chief's headquarters, schoolrooms, radio shops, fire prevention offices and photographic lab

THE CHALLENGE OF ANNEXATION

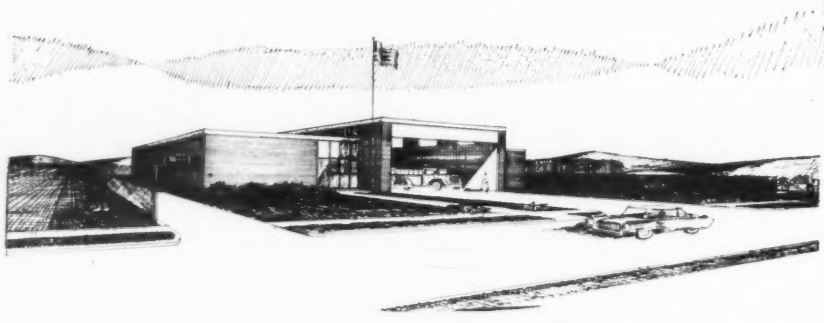
— — The South meets it head-on

By FRANK HANIFIN

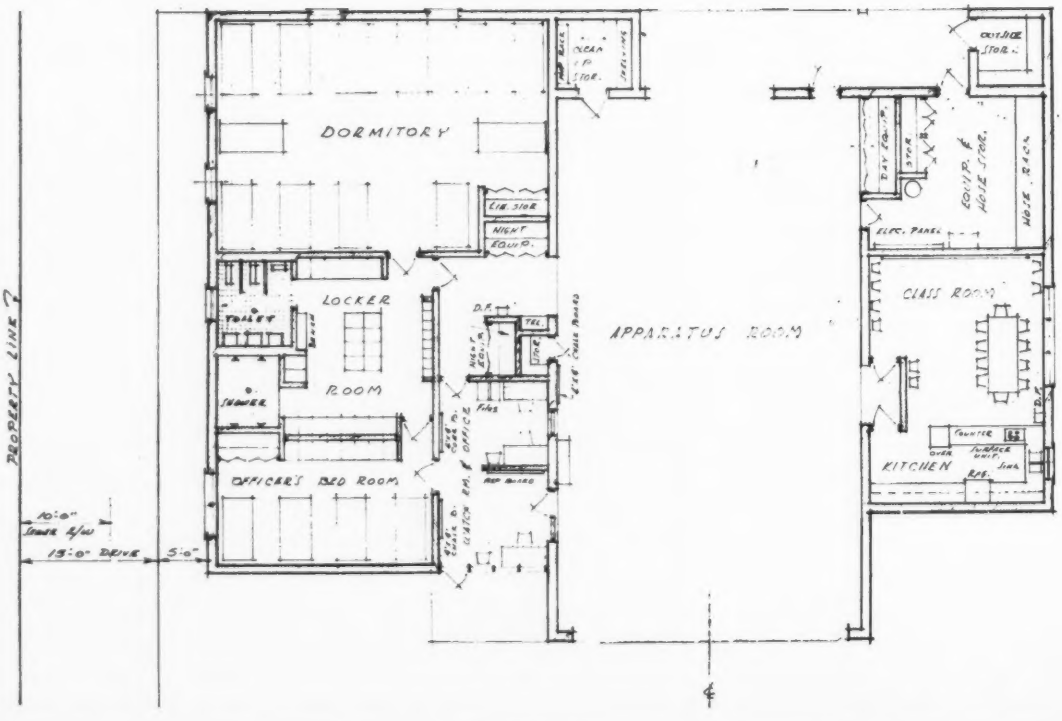
ANNEXATION of surrounding territory by southern cities during 1960 ran the gamut of minor amounts with little significance, to major acquisitions affecting thousands of people. For example, Greensboro, N. C., annexed an area of .28 square mile without a single resident. On the other hand, Mobile, Ala., took in 68.55 square miles encompassing a total of 28,930 people. This ranks third in size in the country during 1960 and is one of the largest in this century. During 1960, Charleston, S. C., annexed 14.9 square miles and 10,000 people. Early this year, the South Carolina Inspection and Rating Bureau reduced fire insurance rates 30 per cent for new City Wards 13 and 14, after the state supreme court upheld merger of the two areas with the city.

On August 5, a detailed plan for merging Henrico County with Richmond, Va., was announced. If approved, it would become effective on January 1, 1963, and would add 232 square miles to the existing 40 square miles, boosting Richmond's population from 218,000 to about 335,000. The national ranking of the community would be changed from 52nd to 36th. Initial reaction appears to be largely favorable. If the move is successful, it will be possibly the largest annexation on record.

Tennessee alone in 1960 saw 35 cities annex territory. From 1955, when the Tennessee General Assembly amended the annexation laws,



Architect Chas. Morrison Grier, A.I.A., designed new Charlotte, N. C., fire station now under construction on Inwood Drive to serve annexed area. Building includes combination classroom-dining room and drive-through facility



until mid-1960, 118 cities in the state effected 258 separate annexations involving 101,909 persons.

One of these concerned the Nashville area. A metropolitan charter, which would have replaced both city and county governments with a new local government which was neither city nor county—metro—was offered to the voters of Davidson County, including the City of Nashville in 1958. County voters outside the city rejected it.

Nashville officials then took steps to effect two annexations. One was a built-up industrial area of 7.7 square miles with 4,000 residents; the other was a predominantly residential area of 42 square miles, with a population of 85,000. (Nashville originally encompassed 22.7 square miles.)

Both annexations were contested in court. The Supreme Court of Tennessee approved the annexation of the 42-square-mile area on March 10, 1961. The litigation regarding the 7.7 square miles, initiated principally by several industrial firms, is still pending.

Meanwhile, however, Fire Chief J. D. Ragsdale, in order to provide adequate fire protection to the new areas when they became part of Nashville, made a detailed survey of the areas in 1958 and set up plans for their protection.

Strengthened central city

The areas annexed to Nashville formerly depended on privately owned and subscription departments for fire protection. Realizing that protection for these areas would have to be provided by the central city, Chief Ragsdale set about strengthening the fire defenses of the city proper. He located fire companies on the outskirts of the central city, by relocations in some instances, and by establishing new companies where necessary. The new fire stations were designed with front and rear doors, and a service area for apparatus maintenance. Nashville voters approved a bond issue of $1 million for fire department improvements. When this article was written in July 1961, Nashville was appropriating another $2,500,000 for the fire department improvement program.

The new bond issue will provide for two fire station relocations within the East Nashville Urban Renewal Area and for three new fire halls in the annexed territory. Meanwhile the city has leased temporary fire station facilities in the vicinity of Nolensville Road and Thompson Lane, in the Municipal Airport area and in the Green Hills section. Mayor Ben West said, on May 23, 1961, that this intermediate service with leased stations will be replaced as rapidly as possible with the new stations to be constructed by the city. "In keeping with our policy of extending city services to the annexed areas as rapidly as possible," Mayor West said, "we have complied with all the requirements and specifications of the Tennessee Inspection Bureau to raise fire protection in the annexed areas from Class 10 to Class 3." The Class 3 fire protection is the same rating applied to the older areas of Nashville.

The program will also provide new ladder trucks, pumpers and other equipment, the expansion and replacement of the fire alarm system and the construction of a "fire test" building at the fire department training center. Fire hydrants are not included in this improvement plan since they are the responsibility of another department.

In July 1961, Nashville was in the process of replacing seven outdated pumpers and two outdated aerial trucks, which were operating in the old city limits. The department also made arrangements to purchase two additional aerial trucks to be used in the old city, which would strengthen truck coverage in the old city and part of the annexed area. The department also planned to purchase one, and possibly two, new ladder trucks to operate in the annexed area, bringing the department's total truck strength to eight.

The Nashville Fire Department is strengthening its pumper service by one in the old city and five additional pumpers which are to be operated in the new and potential annexed area.

For additional manpower to strengthen the central city and for the annexed area combined, Chief Ragsdale estimated that he needed an additional 146 men. By mid-July the department had hired 45 men to take care of immediate needs to serve the annexed area on a temporary basis in order to hold the city's third class insurance rating as recommended by the National Board of Fire Underwriters as immediate requirements.

The chief selected key men who were trained to be the nucleus of cadres to which the new men would be assigned. The combined groups would then be assigned to the new areas or to the central city as needed. In addition, manpower was rotated so that all fire fighters would be exposed to all types of fire fighting. To provide a reservoir of supervisory officers to meet the new demands, Chief Ragsdale gave captains who wished to volunteer, the opportunity to act as battalion chiefs on their off tours to acquire administrative experience.

Even before the court finally approved the annexation, water mains and fire alarm lines were extended into the new territory. A twin-span bridge is being built across the Cumberland River to part of the annexed area.

Mayor West announced that city fire protection extended to the newly annexed areas will save residential property owners an estimated $800,000 a year in fire insurance premiums. John F. Lee, manager of the Tennessee Inspection Bureau, who was present when Mayor West made the announcement, said the bureau would recommend reductions in fire insurance rates applicable to residential properties which will amount to a decrease of approximately $32 per year for each $10,000 in insurance. The reduction will apply to all residential properties in the annexed areas, estimated at 25,000 homes.

Charlotte, N. C.

The Charlotte, N. C., Fire Department, under the leadership of Fire Chief Donald S. Charles, is another example of a department which planned well in advance for annexation and thus avoided the problems that could have arisen. For example, six months prior to annexation, the Charlotte Fire Department surveyed every street in the area to be annexed and planned for its fire protection. When the consolidation became effective, the department was ready. Incidentally, as a result of annexation, more than 400 street names were changed. Alarms are announced "Fire at Jones Street formerly Smith Boulevard."

Earlier, when annexation appeared imminent, a $134,000 bond issue to provide for extension of the fire alarm system was submitted to the voters and approved by them. When the city limits were extended on January 1, 1960 to include another 10,000 homes and 32 square miles of new area, the necessary additional equipment was installed in the central office, fire alarm lines laid out to the perimeter of the city, and work started on the installation of 300 alarm boxes in the new territory.

Charlotte voters in 1957-58 had approved $1,301,000 in water bonds. This money was used to install hydrants and mains in the perimeter of the city to provide basic fire protection needs in accordance with plans developed through studies conducted well in advance of annexation. Approximately 90 per cent of the mains were laid prior to consolidation, the full project was completed shortly after extension of city limits. Those

Continued on page 845

Here's how

By S. E. BARBER
Assistant Chief
Phoenix Fire Department

Financial planning during expansion of a community is a must. Left to right, Finance Director John L. Williams, City Manager Samuel L. Vickers and Chief Dean check fire departent quarterly budget

Assistant Chief Jake Siken, training supervisor, indoctrinates "rookie" class. Phoenix appointed a number of new men months prior to recent annexation and were fully prepared to provide fire protection on date annexation became effective

Typical pumper-tanker unit provided for annexed areas where fire fighting water supply is critical problem

Phoenix Fire Station 15 is typical of recent construction suitable to area

ACCELERATED GROWTH and annexation, caused by tremendous westward migration and resettlement of new citizens since the war years, are challenges faced by many western fire departments. The Phoenix, Ariz., Fire Department may have felt this even more than others.

In 1940 this agency served a city with a total land area of 9.6 square miles and a population of 65,414. Today it furnishes fire protection to 460,140 persons living in a bustling 190 square miles and still growing by leaps and bounds. This represents a 311 per cent increase in population and a 1,009 per cent increase in area.

Fire Chief Harold H. Dean, who has been in command of the Phoenix department since 1954, will be the first to admit that his challenges have been many. City growth through annexation did not present too much of a problem to Phoenix' fire officials prior to 1950. Annexations were relatively small between 1940 and 1950 and averaged ¾ of a square mile per year. Very little additional pressure was put on existing fire fighting facilities and response patterns were not adversely affected in most cases.

Phoenix meets the problem

From 1950 to 1957 the annexation pace stepped up to an average of 2.75 square miles per year. This necessitated relocation of two stations and the addition of four new ones. Planning was relatively unhurried and orderly and presented no unusual problems, other than two stations which were housed in temporary quarters until permanent quarters could be built.

Then the "roof caved in." During 1958, 1959 and 1960, a total of 151.1 square miles was added. One annexation alone amounted to 77.4 square miles.

Chief Dean feels that planning for major annexations such as these can only be done in the broad sense, which will ultimately result in an orderly expansion of the fire department in relation to the service it must perform. This is broken down roughly into three general categories for the sake of convenience. These are: Fiscal planning, physical planning and personnel planning. Actually all are so integrally woven together that it is hard to say where one category leaves off and another begins.

Economics

Fiscal planning, of course, encompasses the use of the tax dollar in providing fire protection for those who are taxed. Phoenix, like many other well-managed cities across the nation, operates under a "tight" fiscal policy which enables it to maintain a stable tax rate year after year. In fact, the tax rate in Phoenix, despite its major annexations and tremendous growth, has not only been stabilized but has actually been reduced since 1950. A "tight" fiscal policy does not mean that city services are downgraded or curtailed, but rather that departmental budgets are analyzed thoroughly from the standpoint of purpose and maximum effectiveness. Then, as the fiscal year progresses, it is constantly in a state of review to determine the efficiency of administrative procedures in attaining the end result of maximum tax dollar service.

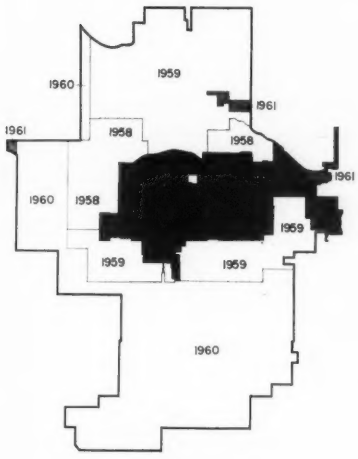
Fiscal planning in Phoenix has not only been on an annual basis for needed stations, equipment and manpower, but has been projected 20 years ahead. Land use patterns, population trends and other studies have been utilized by planning officers in determining probable needs for these future years. Through these studies and the resultant projections, fiscal plans for each succeeding year have been outlined.

Long-range strategy

Physical planning included those features of fire department operation which have to do with station location, response patterns, water supply, fire alarm communications, organization, equipment, procedures and the many other tangibles which enter into the total picture of a well-rounded fire department operation. Here again, studies conducted or sponsored by the city's planning department were utilized to project the needs of the fire department in each particular area.

As an example, population densities, land use patterns, and other factors such as existing and proposed freeways and arterials, along with natural and man-made barriers, were utilized in determining needed station locations. Response patterns, as well as structural conditions—both existing or predicted—are given due consideration before station locations are decided upon. Even with such carefully detailed studies, which have proven fairly accurate, an occasional re-evaluation and adjustment must be made. In one instance high-value build-up in an area was so rapid and extensive that one station site planned in 1959 was redeployed from residential response to high-value response in the 1961 review of station locations. Fortunately station construction had not actually started and the wisdom of a periodic review of planning was upheld at no expense to the city.

In the rapid development of suburban tracts, a "leap-frog" pattern of growth has been encountered. This has come about through large-scale developers buying outlying acreages of undeveloped farm and desert lands to suit their needs, and which are usually obtained at a lower cost per acre than smaller close-in tracts. As these developed into homes, shopping



Phoenix Expansion
Population 460,712
Area 189.8

centers and industrial sites, major gaps of vacant areas were left between them and the intervening existing built-up areas.

As these newly created population centers and industrial areas were annexed, it was inevitable that station location problems would result. To meet this situation, fire stations were established on the outer perimeter of the new city limits in the heavily built-up areas. Thus instead of a station building program designed to spread outward in the conventional manner from the heart of the city, the Phoenix plan locates on a priority basis in a "both ends toward the middle" pattern as determined by value and population density.

Such a policy has had its effect on station design as well as location. Where trends indicate certain conditions may exist in the foreseeable future, stations are built to accommodate not only engine companies but possible future squad, hose and ladder companies as indicated by planning studies. This has consistently proven itself to be a wise policy in that costly remodeling jobs have been avoided. Prior to the establishment of this policy, a station that was built early in 1950 had to be completely remodeled and enlarged at a very expensive figure. In addition, land area was needed and its purchase further increased the cost.

Manpower management

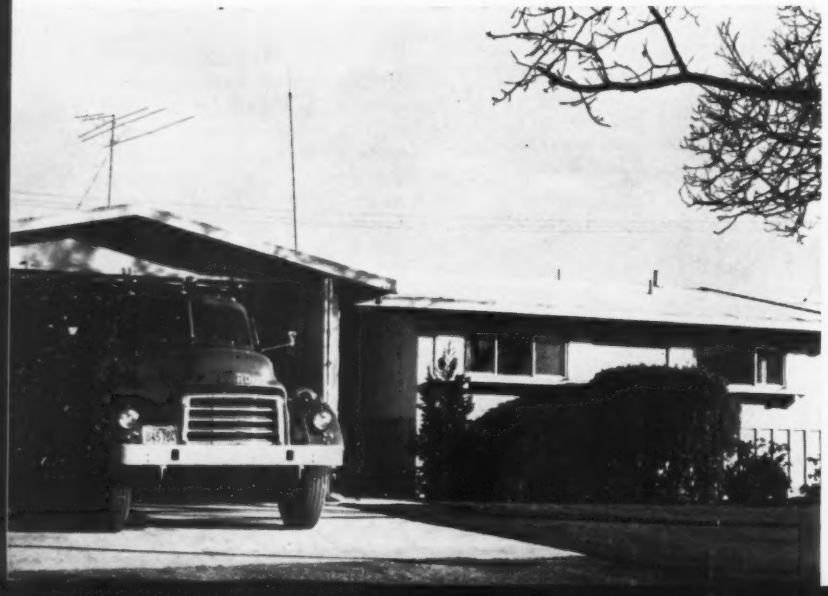
Personnel planning encompasses recruitment, training and utilization of

Continued on page 878

Typical of permanent stations that will eventually replace San Jose's temporary houses is this new Third Battalion headquarters

THE CHALLENGE OF ANNEXATION

San Jose experiment proves value of lease-purchase system by . . .



Utilizing residences as fire stations

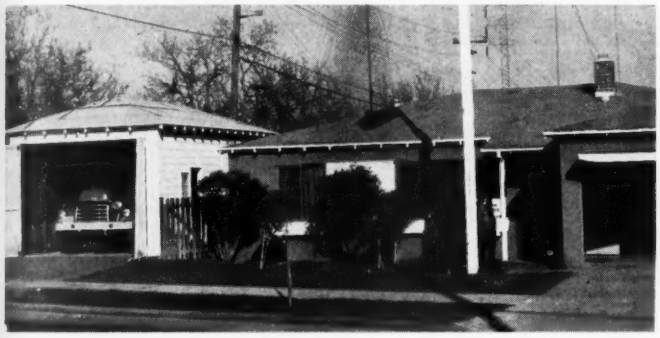
By R. L. NAILEN

Engine 14 in quarters on the rural outskirts of southwest San Jose. Note use of attached residential garage with special high door to house apparatus. In service four and one-half years, this station will soon be replaced

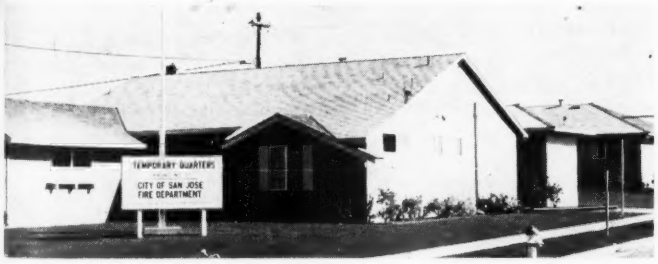
FASTEST GROWING of practically all metropolitan areas in the world is the nine-county San Francisco Bay Region. Communities here are desperately scrambling to furnish fire protection to a population increasing as much as 300 per cent every 10 years. A major problem is properly locating firehouses to serve mushrooming suburbs where it is hard to foresee land use in future years, even with the best of planning. Seven years ago the City of San Jose, 50 miles south of San Francisco, developed a unique solution: Lease or purchase of single-family dwellings for temporary use as suburban firehouses until permanent ones could be built. San Jose now has four of these stations.

Many such growth areas enter the city through annexation of unincorporated territory—land that is largely agricultural, and is annexed by developers' petitions so they can offer city services to home buyers. How much of the farmland will be built on, or when, is unknown at the time. Other areas may build up into high-value districts before annexation; when the residents and businessmen ask to join the city, fire protection must be made available to them right away.

It is hard to decide how best to serve these areas. Explains Chief Ronald LeBeau of the San Jose Fire Department: "Suppose you annex an area where a big commercial development is planned, and build a $150,000 station. Maybe in a few years you find the developer's plans didn't work out, and the area has grown in a different way so all you really need out there is a single engine company. Then where are you?" The other side of the coin is expressed by retired Chief L. A. O'Brien, who began the temporary firehouse program in 1954. Says he: "We've found that in building station houses without future planning, some of them have proved too small to take care of the territorial developments which followed."



Also due for early replacement is this temporary station of Engine 9. Use of separate apparatus garage is more typical of these houses



Newest temporary firehouse is Engine 17, in service since November 1960. This house was purchased by the city

Closeup of Engine 17's apparatus garage. The building can easily be removed from the site when the station is deactivated

San Jose's answer

San Jose's answer is to use a temporary station for three to five years as development firms up; buy property meanwhile in what looks like a good permanent location and hold it; when the need is clear, either build permanently on the property, or sell it (almost invariably at a profit in a growth area) and pick a better spot.

To point up that growth, here are some figures: In 1940, San Jose population was 68,000; by 1950, 95,000; last year, 202,000. City land area is up 600 per cent over the 20 years; assessed valuation (a fraction of market value) approached half a billion dollars. Population is calculated to reach and pass San Francisco's 775,000 within a dozen years.

Keeping pace, the 107-year-old fire department has grown since 1940 from six engines, one ancient aerial, a half-dozen obsolete chemical wagons, and 82 men, to 16 engines, four aerials, 259 men, and plenty of supporting equipment. Of the city's 10 pre-World War II fire stations, only one remains. The number of alarms answered has gone up 600 per cent in 20 years, totalling now 4,000 per year. The city has a Class 4 insurance rating, and hopes to make Class 3 soon.

Four of the new engine companies (plus a fifth until just recently, are housed in single-family residences in newly annexed areas—some as much as 10 miles from what used to be the city proper. Chief LeBeau explains how the houses are selected: "We look for a three or four-bedroom house in the 15,000-square-foot class, located on a corner for quick response in as many directions as possible. Because the average residential garage isn't big enough for the rig, we put down a concrete slab next to the house and on that we set up a bolted-together apparatus garage." One of the temporary stations (Engine 14,

Continued on page 818

Southern Nevada's only aerial trucks, 65-foot ladder (left) of Las Vegas Fire Department and 85-foot ladder of Clark County by Sahara Hotel—*Photo by Las Vegas News Bureau*

Las Vegas Fire Department headquarters recently underwent major remodeling with addition to two apparatus stalls at left. Administrative offices and dormitories are at right—*Photo by Ken Jones, Las Vegas Sun*

THE CHALLENGE

Nevada's two

LAS VEGAS

Las Vegas firemen in hot drill on old building. Department takes full advantage of old structures to keep up training—*Las Vegas F. D. photo*

A DESERT WATERING HOLE for pioneers has now become Nevada's largest city and one of the entertainment capitals of the world; and with growth has come many headaches for the Las Vegas Fire Department. Perhaps the most noteworthy achievement of the department and its chief engineer, Doug Williams, is that it has doggedly kept pace with its problems by careful and judicious planning.

Las Vegas was sparked into modern life in 1905 when the Union Pacific Railroad came through and the city and its water wells became a key division on the line between Salt Lake City and Los Angeles. In the 1930's Las Vegas served as a supply center for construction of Hoover (Boulder) Dam.

Real growth and the resulting problems didn't come until after World War II when the fabulous Las Vegas "Strip" was born. With this boom came men to build new hotels and men and women to keep them going. In 1950 the census listed 24,624 in the city. The 1960 report counted 64,606, and today it is estimated the city has more than 70,000 inhabitants in its 27.1 square miles.

The fire department was formally born as a volunteer organization in February 1924. From 20 to 25 men made up the department which had two pieces of equipment in the old station on North 2nd Street. In September 1942 it became a paid unit.

Today, Chief Williams commands 107 men operating from five stations. The command staff includes Elmer H. Nighswonger, assistant chief; two battalion chiefs who command the fire fighting platoons and a captain in charge of the three inspectors in the fire prevention bureau. The department has in service seven pumpers, three tankers, two reserves, a civil defense rig, a rescue truck and a 65-foot aerial. A new pumper will be delivered later this year.

One of the department's problems for many years was contract-protection of the Strip hotels. With establishment of the Clark County Fire Department in 1953, municipal protection to the hotels located in unincorporated territory ceased. The problem of mutual aid was a delicate one.

OF ANNEXATION

largest fire departments protect booming resort area

By CLIFF DEKTAR

At one time, the Las Vegas Fire Department, operating under instructions from the city administration, was told not to furnish assistance to the county. Time and several incidents, with resulting bad public relations, has modified this order.

Another major problem which faced the city in 1954 was that of water. The Las Vegas Land and Water Co., a subsidiary of the Union Pacific Railroad, could not, or would not, keep up with the growth of the area by extending adequate mains to new areas. In 1953, bonds of $8,700,000 were voted by the people to purchase the wells and the water system and to build a new water line 30 miles to Lake Mead. Thus the Las Vegas Valley Water District was born. Completed in 1957, the system provides adequate water for the fast-growing area and for fire fighting purposes.

Telephone troubles

Another problem, even more critical than water, was the virtual breakdown of the Las Vegas telephone system in the mid-50's. The old central office-operator manual system just could not handle the demands of the booming area and the possibility of delayed alarms was a specter which constantly haunted the fire department. The telephone company decided to convert to an entirely new system with modern equipment and dial phones. It applied to the city for a new franchise and when it was granted, one of the key provisions was that the fire department was to be allowed to put its own conduit into telephone company trenches, rent duct space or use company poles for its communications and alarm system.

In 1955, with the new franchise agreed on and construction about to start, the fire department asked voters to approve $200,000 for a new alarm system and $400,000 for stations and equipment. A new alarm and communications center was built adjacent to fire department headquarters, and using the telephone company trenches being excavated for the new phone system, underground lines were installed in all stations. A telegraph alarm system was constructed and today

Continued on page 820

CLARK COUNTY

ONE OF THE HEAVIEST missions in protection of life in establishments of high public use in the United States is the responsibility of the Clark County, Nev., Fire Department which protects the fabulous Las Vegas Strip with its numerous resort hotels, motels, shops, casinos—with thousands of visitors each day. The Strip is located along several miles of Las Vegas Boulevard on U. S. 91, just south of the city itself, and in addition to the resort facilities, is also the location of McCarran Field, the main Las Vegas airport, and the new Las Vegas Convention Center, site of the IAFC convention.

William Trelease is the present and first chief of the department which was established in 1953. He formally took over the protection of the Strip on January 1, 1954. Chief Trelease is a veteran Las Vegas fireman and was one of the volunteers in that city who furnished fire protection prior to the establishment of a paid department in 1942.

Initial operations began from one station adjacent to the Flamingo Hotel. Today, three additional stations are in use and two others are in the planning stages. The Flamingo station houses a pumper plus a 1,000-gallon tanker, while the other major Strip station on Industrial Road near the Stardust Hotel, houses a pumper, tanker, rescue unit and a recently acquired 85-foot aerial, currently the area's largest ladder rig.

The department is in process of completing a new station at McCarran Field where a recently acquired crash truck, a 1,000-gallon tanker and a rescue jeep are stationed. The most recent station opened was in the Sunrise Area where a tanker and pumper are housed at present.

Alarms are received at the Flamingo Station where direct lines from the 11 big hotels are terminated at the main switchboard. Direct lines from Flamingo link the other stations. Two-way radio is mounted on all equipment and operates on the same frequency as the Las Vegas Fire Department.

The department has 67 men and operates on a two-platoon system. There is no civil service protection at present. Key personnel, in addition to the chief, are Assistant Chief Herman

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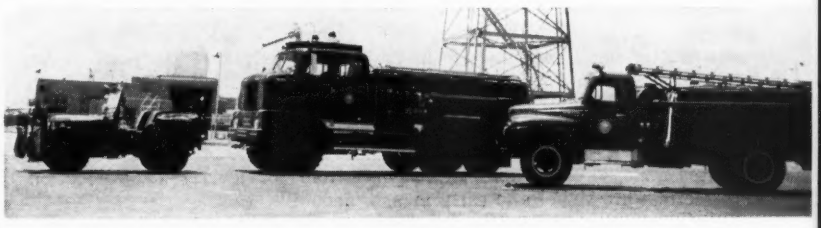


***The Clark County Fire Department provides protection at McCarran Field, Las Vegas' busy airport. Shown left to right are a rescue jeep, a new crash truck (another is on order) and a 1,000-gallon tanker**—Las Vegas News Bureau photo*

***An aerial view of the Las Vegas Convention Center, site of IAFC conference and exhibits. At left rear is the Las Vegas Race Track, used by the Clark County Fire Department as a training site**—Las Vegas News Bureau photo*

Night view of Engine 30 station which replaced a volunteer unit in the annexed Nestor area of South San Diego. Alarms are relayed by radio due to the great distance from central fire alarm office. An open house celebration was held to inaugurate Engine 31's new quarters in the annexed territory of Allied Gardens—*Official San Diego F. D. photos by McDowell*

THE CHALLENGE OF ANNEXATION

In the Far West, San Diego feels the pinch

By ROI B. WOOLLEY

SAN DIEGO has been described as a group of suburbs in search of a city. Maps of the community follow strange, interlocking crazy-quilt patterns, marvelous to behold. Within the metropolitan area are remote islands —no man's lands. Fire companies, police officers and ambulances have been known to arrive at the scene of an emergency in a disputed territory, and stand off to observe from some not too clearly defined boundary line whether or not some other team or unit from another political jurisdiction would arrive to assume responsibility. They have been known to become lost and never reach their objectives.

It is standard practice in San Diego for certain fire vehicles to carry maps to help orient responding fire fighters. These guides are subject to change without notice as overnight almost, new additions, new roads and highways—in fact, entire new political subdivisions—are created.

Fantastic growth

This is all part and parcel of the fantastic growth of Southern California. At this writing (statistics are changing overnight) the City of San Diego has a population of 588,400. In 1950 it was 334,387; 20 years ago, 203,000. Since 1928, the city has jumped in population from 24th to 18th in the nation. In area it covers nearly 250 square miles. At its present rate of growth the city will have a population in excess of 750,000 in 1970.

The County of San Diego constitutes metropolitan San Diego, an area of 4,258 square miles, with a population of 1,000,856 (1960). This should reach 1,285,000 by the year 1970. A vast, irregular-shaped body, it extends from the Mexican Border to Riverside and Orange Counties over 50 miles north, and from the Pacific Ocean on the west, eastward to the Peninsular Mountains and beyond, into the desert. Elevation varies from 11 feet to 1,586 feet in the city and from sea level to 6,500 feet in the county.

Much of the county is still strange to man, uncultivated and unsettled. Vast acreage is occupied by Cleveland National Forest and Anza-Borrego Desert State Park, and by Camp Pendleton Marine Corps Reservation. These may be undeveloped areas, but they spawn serious fires and require considerable state forestry and other fire protection efforts.

San Diego has reached long, slender tenacles down country highways to take in groups of houses and ranches a mile or two from the center of towns, some of them little more than crossroads communities, thus swelling the size of satellite cities that are already part of the metropolitan mixture of the city. In some instances, the people who lived along a country highway suddenly found it was a street and themselves in a strange situation. Their homes remained in the country, but the street which now carried all utility pipe lines, etc., was in the city. Not infrequently, political subdivisions, or incohate cities, wrestled over the same patch of territory. As both San Diego and its 10 satellite cities expanded, the headaches over government and political jurisdiction, municipal services, including fire protection, and just who was to pay for what, multiplied accordingly.

Incorporation threats

Incorporation threats on the borders of already incorporated cities result in annexation drives. The physical expansion of the City of San Diego to the north and south in recent years has been phenomenal. To the north, the city has run into the Del Mar incorporation. Del Mar, population 3,000, known for its famous race track, at this moment is engaged in an internal squabble over whether to annex to San Diego or not. Only a year ago Del Mar voted to retain its own independence and incorporated. Shortly afterwards it formed its own fire department, ending the protective service previously provided by state for-

Continued on page 812

Chicago places high speed fire and rescue boats in service

Chicago Fire Department's new fire and rescue boat speeds through the Chicago River at more than 40 miles per hour en route to an emergency. Note bow turret and discharge wye

All photos are official Chicago Fire Department photographs

By NEAL CALLAHAN

PATROLLING the many miles of Chicago's waterways are soon to be some of the fastest and most maneuverable fire and rescue boats in the world. Able to travel nearly 45 miles per hour, and pump over 2,500 gallons of water a minute, the Chicago Fire Department developed and placed the first of these boats in service early in 1961, the first fire department to do so.

Chicago waterways have always presented a problem for the fire department. Commissioner Quinn, realizing this, has followed closely the development of fire boats. However, he felt the need for speed, as well as fire fighting capabilities. The introduction of the "jet" speed boat provided the answer. He immediately ordered a study of this type, to see if it could be converted into a small fire and rescue unit.

Through the cooperation of the manufacturer, manifolds and other equipment were placed upon one of the craft. Engineers labored over it until the present fire and rescue unit was perfected, and capable of not only traveling at great speed, but also of pumping a large quantity of water at good pressures. Again, through the cooperation of the manufacturer, the pilot boat was shipped to Chicago where it underwent a series of tests, all of which proved successful.

Firemen assigned to the fire and rescue boats are qualified skin divers. Men shown here have recovered body of a small boy from the water of the Chicago River

Fore and aft turret pipes in operation. Good fire fighting capabilities of small craft are expected to be an excellent supplement to larger Chicago fire boats

All personnel assigned to the fire and rescue boats are qualified skin and scuba divers, and standard equipment on the boats includes diving apparatus and clothing, along with standard nozzles, fire fighting turret pipes, axes, pike poles, plus first aid kits, inhalators and other emergency equipment.

Special equipment carried on the boat includes a 4-inch hydrant outlet which is used to supply land companies with water. Employing all discharge valves, the boat can supply enough water to keep three engine companies pumping. Besides the turret pipes, four hand lines can be taken from the boat, two from the front and two from the rear. Hose is limited to 100 feet of 1½-inch for stretching between boats or to land.

The unit is powered by a 240-hp marine engine and operates on the principle of drawing water into its pumps and forcing it out the rear at great pressure. There is no rudder or prop and the water jet is also used to steer.

The hull is made of fiber glass and its total weight is 3,300 pounds. The units are equipped with such devices as loud speaker systems, sirens, running lights, emergency lights, spotlights, boarding ladders and life jackets.

At present, the fire department has

Continued on page 814

By **CLARENCE E. MEEK** *Honorary Deputy Chief, Librarian, New York Fire Department Library*

From flying squadrons to squads . . . The history of fire

"BUCKET BRIGADE to Flying Squadron" was the title of a book written by Herbert T. Jenness and published in 1909 by George Ellis Company, Boston. It combined in this name the primitive fire bucket and the then latest in fire fighting strategy—the motorized flying squadron, or squad, as it is now abbreviated. Flying squadron was a good designation, conveying as it did the idea of speed and distance, in contrast to the 15-mph-horse-drawn apparatus of limited operating range in that era.

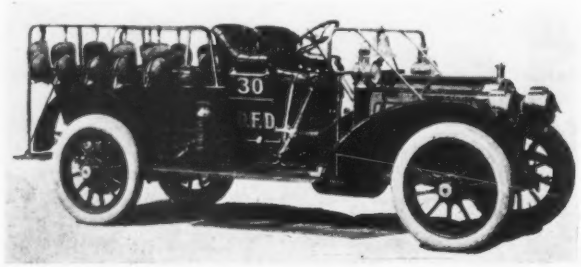
The flying squadron was originally conceived as an answer to a problem which had bothered paid fire departments ever since the professionals had first taken over the volunteer companies and replaced 50 or more men with a dozen, or less. The problem of manpower shortage occurred during those hours of the day when it was customary for about one-third of the entire force to be absent at one time on meal-leave.

During the first half-century of the paid service, firemen worked the single platoon, or continuous-duty system, with an occasional day off, and usually three one-hour meal-leaves in each 24 hours. Generally, working strengths were maintained at higher levels than they are today, except during meal periods.

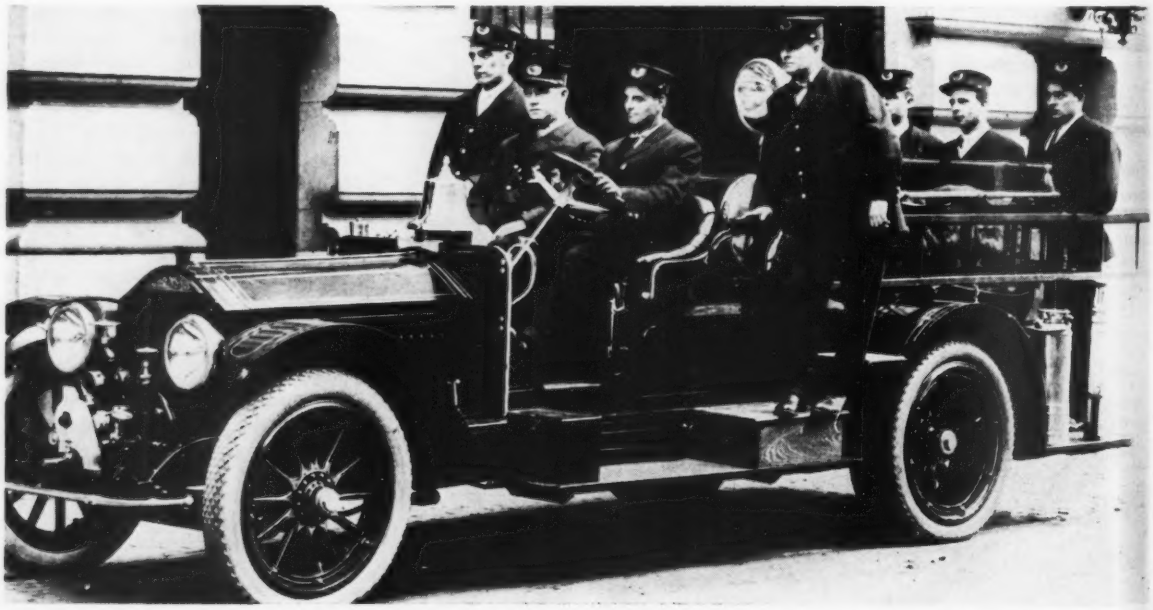
With the advent of motor vehicles capable of covering large areas at sustained speeds, someone saw the possibilities of a personnel-carrier which could transport a crew large enough to fill in the companies at a one-alarm "worker" and get these centrally located replacements to any part of the average-sized city in time to assist in even first-stage operations.

Fire and Water Engineering more than 40 years ago, carried a feature article on the use of personnel-carrying vehicles under the title of "The Flying Squadron System," and this journal also had editorials, news items and correspondence with officials discussing the advantages of motorized units transporting personnel to fires to fill out shorthanded crews.

In most cities, when a box "was in," the officers of companies assigned to respond on possible subsequent alarms held their men from going to meals until the "all out" taps were received, and as a result, meal-leave shortages were not as serious on multiple alarms. If the companies on a first-alarm as-



Detroit's "flying squadron," first in U. S. fire service, was the fourth auto placed in service in the department. According to "Fire and Water," November 25, 1908, it was an "'09" Packard with a new "UB"-type engine on the Packard 30 chassis with heavier springs. Rated speed was 65 mph, not loaded



Two of first booster apparatus delivered in 1913 to Cincinnati were quickly pressed into service for "flying squad" units. Ahrens-Fox apparatus featured front-mount pump and excellent speed for the times

signment could be brought up to full strength by the arrival of a flying squadron with eight to a dozen men, it would be an effective answer to the problem.

Detroit was the first city to adopt the idea, putting Engine Company 30 into service in October 1908, as an "auxiliary squadron" of 15 men. The apparatus was a Packard chassis with squad-type body built in the department shops and seating 14 men. Appliances carried included three hand extinguishers, door opener, two axes and a stretcher.

During the meal-leaves of the other companies, and at night, Engine 30 responded to all first alarms from boxes in the high-value districts. When the breakfast and mid-day meal-leaves were over the squadron went out of service for three hours and sent all hands to meals, the squad members having only these two meal-leaves each day. The extra manpower provided by Engine 30 at night fires, when the other companies were up to full strength, was said to be a factor in holding down the number of multiple alarms during the night hours when large fires were most apt to occur.

The auxiliary squadron plan proved so satisfactory in Detroit that three more such units were organized. The four squads—Engine Companies 30, 34, 36 and 40— were continued in auxiliary squad service on the original plan until 1918, when one by one these units became regular pumper companies and were eventually replaced by four rescue squads designated as Rescue Squads 1, 2, 3 and 4.

While the four original rescue squads were, and still are, basically manpower units for fire service, their equipment was augmented to include life nets, cutting equipment and various specialized tools. In 1947, Squad 5 was added, and in 1950, Squads 6 and 7 were organized, the word "rescue" having in the meantime been eliminated from the company designation.

One of the seven squads responds to all first alarms by telegraph, another on second alarms, and a third on fourths. The personnel have been specially trained and their operations are reported as being very effective and satisfactory, both as manpower units and rescue squads. In 1960, the Detroit squads responded to a total of 14,974 calls and traveled 70,897 miles.

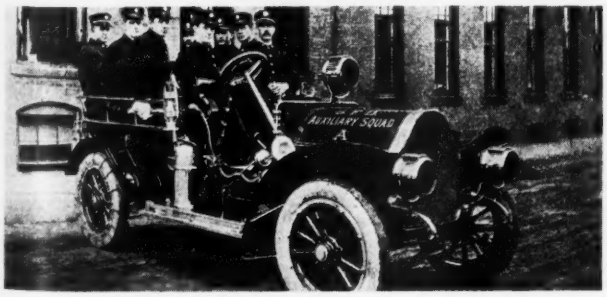
Springfield, Mass., was another of the pioneer cities to adopt flying squadrons. In 1908, Squadrons A and B were organized and responded with eight men each to all box alarms. At the time, the Springfield department had about an equal number of full-time and "call" men, and their problem was said to be the delay before call men could arrive at a fire, they being mostly dependent on "shanks mare" and trolley cars for transportation. Arrival of the auxiliary squadrons usually enabled the few full-paid men who responded with the apparatus to be in full-scale operation before the call men began to report.

Chief Thomas A. Clancy, of Milwaukee, was an early advocate of the use of flying squadrons for filling out regular line companies reporting short-handed at fires, and in 1912, his department tried the experiment of organizing Squadron No. 1 with 16 men detailed from as many engine

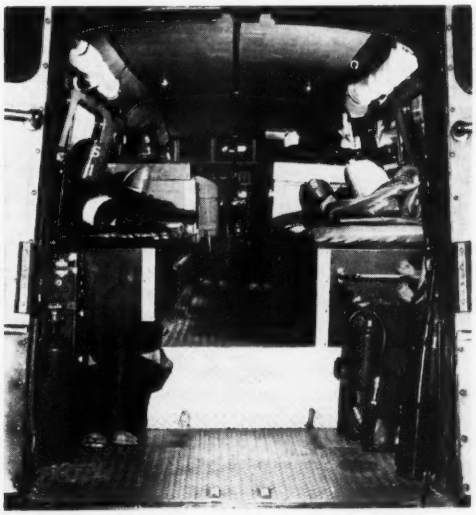
Continued on page 859

department manpower units

Detroit Fire Department squad unit in service at present. Department was pioneer in use of the special manpower companies



◀ *Flying Squadron "A" Springfield, Mass., employed apparatus built on Knox chassis. Unit was intended to take up "slack" pending arrival of "call" men*



Interior of modern Detroit squad vehicle

Both photos Official Detroit F. D. by Instructor J. A. Mancinelli

Fire Chief's Choice . . .

Single-Stage or Two-Stage Centrifugal Pumps

By R. B. SARGENT

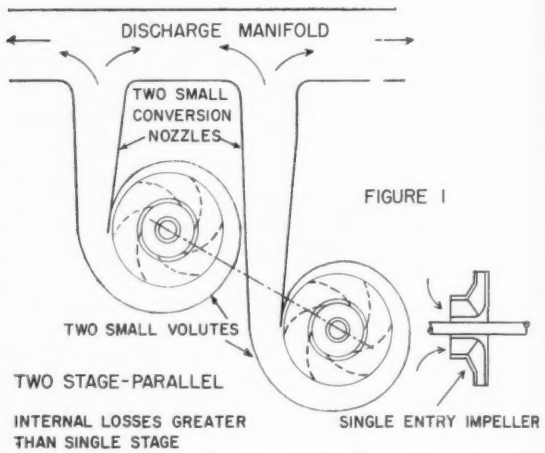


FIGURE 1

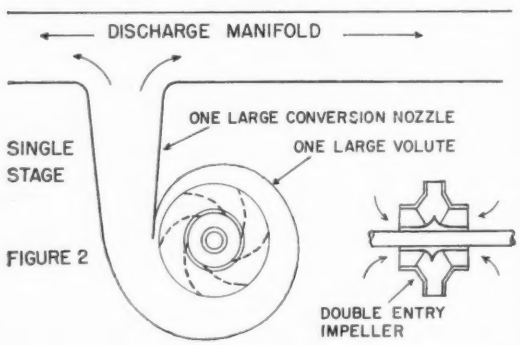


FIGURE 2

CURRENT INCREASE in use of single-stage centrifugal fire pumps poses a question to prospective fire apparatus purchasers. "Shall we specify a single-stage or a two-stage series-parallel pump?" There may be a good deal of discussion, among the operators and those responsible for writing specifications, about the merits of the two designs. Someone is sure to say, "our first pumper, bought 35 years ago, had a single-stage centrifugal pump. Now we have series-parallel or "pressure-volume" centrifugals. If we buy a single-stage pump, are we going backwards?"

For simplicity let us consider a 1000-gallon pumper, single and two-stage. The laws governing pressure, speed, flow, etc. are the same, regardless of pump size. Efficiency is likely to be higher on a large pump than on a small one. Before the NBFU change from class B to class A rating, a pumper had to perform according to the following table.

Class B Rating

Capacity (gpm)	*Pressure (psi)*	*Maximum Allowable Engine Speed (peak hp rpm)*	*Ratio of Pressure to Pressure at Capacity*	*Delivered Water HP*
1,000	120	80%	1	70.0
500	200	90%	1.67	58.3
333	250	90%	2.08	48.5

With a single stage, the engine speed was always lowest at the capacity run, since engine speed varies roughly as the square root of the pressure. But at the lowest speed, the engine had the least horsepower, where it was most needed to deliver 70 water horsepower. At 250 psi, 333 gpm, engine speed and horsepower were greatest, with only 48.5 hp needed. With the single-stage we were faced with the necessity of keeping engine speed low for the 250-pound spot. The speed at the capacity spot then became so low that there was scarcely enough horsepower to adequately meet the capacity run. The following table shows the engine speed at the Class B underwriters "spots" for a typical single-stage pump. Most truck motors in the days of the Class B rating peaked around 2,000 rpm.

Engine Peak Speed 2,000 RPM

GPM	*PSI*	*Engine RPM*	*Maximum Allowable Engine RPM*
1,000	120	1,230	1,600
500	200	1,520	1,800
333	250	1,760	1,800

This dilemma was solved about 1927 by the first series-parallel centrifugal fire apparatus pump. The pressure-increase ratio, 120 to 250, was 2 08 to one. By selectively changing the impellers within the pump from parallel to series operation, the pressure was doubled and the capacity cut in half, all at approximately constant engine speed and correspondingly constant available horsepower. The two-stage series-parallel (pressure-volume) admirably met the Class B rating.

Actually the first series-parallel pump had two sets of two impellers, or four impellers, but the principle was exactly the same as the current two-stage series-parallel normally having two impellers.

Class A Rating

Capacity (gpm)	*Pressure (psi)*	*Maximum Allowable Engine Speed*	*Ratio of Pressure to Pressure at Capacity*	*Delivered Water HP*
1,000	150	Governed	1.0	87.5
700	200	Governed	1.33	81.7
500	250	Governed	1.68	72.9

Comparing the Class A rating with the Class B rating, it will be noted that the pressure spread of Class A is 100 psi, substantially less than the 130 psi Class B pressure spread. The spread in delivered water horsepower is also substantially less.

(The Class A and B ratings, changes to them, or any future new ratings are the result of intensive cooperative study, by the NBFU, NFPA, IAFC and the Fire Apparatus Manufacturers.)

The single stage pump is coming back. Why? Partly because it well fits the Class A rating; and partly because modern truck engines now have more power and higher peak speeds than they had even five years ago. Another minor reason is the recent change in engine speed limits, from 80 and 90 per cent of peak engine rpm to governed engine speed. But the greatest reason is *simplicity of operation.*

There are good technical reasons for the increasing popularity of the single-stage pump. No mechanical, hydraulic or electrical apparatus is ever 100 per cent efficient. We always have to put more power into it than we get out of it. The power absorbed by the pump itself represents a loss, and the water horsepower delivered by the pump divided by the mechanical horsepower put into the pump, represents the efficiency, always less than 100 per cent.

ABOUT THE AUTHOR

"Dick" Sargent is a well-known consulting engineer prominent in initiating new designs for fire pumps. He obtained a B.S. in mechanical engineering from the University of Illinois in 1924, and joined Mack Trucks, Inc. as an experimental engineer. He became a Mack fire apparatus engineer in 1928 and then joined Sun Oil Company in 1932 as an automotive engineer. In 1935 he joined Hale Fire Pump Co. as an experimental engineer, progressing to general manager in 1946 and consulting engineer in 1956.

He is the inventor or co-inventor of a number of patented automotive or pump devices and is a member of the American Society of Mechanical Engineers, Society of Automotive Engineers and the Fire Department Committee, NFPA, representing the Fire Apparatus Manufacturers Association.

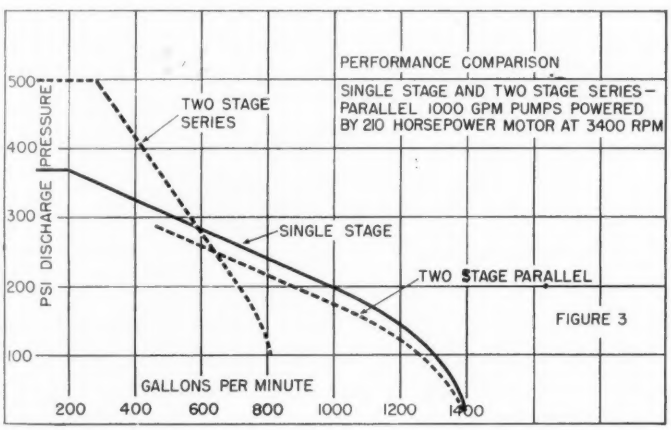


FIGURE 3

The single-stage pump has inherently lower internal hydraulic losses than the two-stage series-parallel, both designed with equal care and skill. First, there is only one (double entry in the larger sizes) impeller in a single-stage pump. An impeller may be considered a disc, rapidly rotating while completely immersed in water. It takes power to revolve the impeller in a liquid, whether or not the pump is actually delivering water. This power can be determined by the formula

$$hp = \frac{.375 \times rpm^3 \times D^5}{10^9}$$

where rpm is impeller speed and "D" is impeller diameter in feet. For a 9½ inch impeller, at 150 psi, 3,560 rpm, the horsepower absorbed in disc friction alone is 5.28. This loss is always there, whether water is flowing or not, so long as the pump is running at this impeller rpm and full of water. It increases to 11.4 hp at 250 psi. So one impeller, single-stage, saves from 5 hp to 12 hp compared to two impellers in a two-stage series-parallel pump.

Secondly, the larger water passages in the single-stage, especially on the discharge side, reduce internal friction loss. A single-stage has one large volute and conversion nozzle. The two-stage has two of each. The velocity of water leaving the volute chambers must be approximately the same for either pump, since this is dependent on the pressure. We can push a given amount of water through one large tube with less pressure drop, than we can the same amount of water through two smaller tubes, having the same velocity of flow in each case, and therefore the same total cross-sectional area. For example, from fire hose friction loss tables, we note the friction loss through two parallel 100-foot lengths of 2½-inch fire hose with 500 gpm flowing through each hose is 55 psi. But 1,000 gpm flowing through one 100-foot length of 3½-inch hose shows a friction loss of only 34 psi. The cross-sectional areas are almost the same.

Similarly, one waterway within the pump has less friction loss than two waterways, each of half the area. While it is true that they are not 100 feet long, nevertheless the one large volute nozzle of the single-stage contributes to less internal hydraulic friction and therefore the higher efficiency of the single-stage. (See Figs. 1 and 2.) Each impeller has an "eye" through which the water enters. The 1,000 gpm or larger single-stage pump usually uses one double-entry impeller.

It is quite true that the two-stage series-parallel pump will cover a greater range of pressure at reasonable engine speeds than will the single stage (Fig. 3 illustrates this.) The motor selected has 210 hp at 3,400 rpm governed speed. The dash line shows the maximum performance (normal barometer at 1,000 feet elevation) of a two-stage series-parallel 1,000-gpm pump. The full line shows the maximum performance of a single-stage, same conditions. Fifteen per cent of engine power is deducted for accessories in both cases. Lift is 10 feet with 20 feet of 6-inch suction hose, for both pumps. In normal fire department usage below 300 psi, the more efficient single-stage delivers an average of 10 per cent more water. With larger engines, 250 to 300 hp, there will be a corresponding advantage in the single-stage.

The single-stage pump is simple in construction and operation. There is no transfer valve and there are no suction check valves. The single-stage

Continued on page 876

Hose samples exposed for 24 hours in 17 per cent sulfuric acid at 75 degrees. Jacket of 100 per cent polyester fiber (left) was unaffected; jacket of all-cotton (center) was severely damaged; and sample at right with jacket of cotton warp and polyester filling shows cotton severely damaged

Photos courtesy E. I. Du Pont de Nemours & Co.

Properties of fire hose jackets

A comparison of polyester fibers with all-cotton as used in hose construction

By WILLIAM H. JAMIESON

SURVEYS OF FIRE HOSE preferences reported in FIRE ENGINEERING during 1958 and 1959, showed an increasing trend toward the use of hose jacketed with synthetic fiber, or hose fabricated with a combination of man-made fiber and cotton. In cities of more than 10,000 population, 68 per cent of the fire departments responding to the survey questions indicated a preference for hose of "Dacron" and cotton. In cities of less than 10,000 population, 74 per cent of the respondents expressed a preference for this type of construction.

Although fire chiefs participating in the survey leaned heavily toward this combination of fibers, recent informal contacts with fire departments in both large and small cities have disclosed that the actual fiber content of hose in use is not always known, and that there may be some misunderstanding about maintenance required for different types of hose.

Basically, there are two types of hose jacket constructions available utilizing polyester fiber—those which emply it 100 per cent and those using it in combination with cotton. The outstanding advantage to firemen using hose jacketed with 100 per cent polyester is the elimination of drying before repacking. Other advantages include resistance to mildew, flexibility, light weight, and ease of handling.

Hose with combination fabrics containing cotton cannot be repacked wet and must be maintained as if jacketed completely with cotton, which requires drying. It is, however, more flexible, lighter in weight, and easier to handle than that jacketed 100 per cent with cotton. It is important, therefore, that fire hose purchasers recognize the difference.

If there is a doubt about which construction has been used in a particular hose, it is wise to consult purchase orders. Unless the order states clearly that the hose is jacketed 100 per cent with polyester, there is a good possibility that the jacketing contains some cotton. In that case, the hose cannot be repacked wet, and may be subject to mildew if not dried.

If purchase orders do not state specifically the fiber content of the jacket,

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Construction of hose jacketing, either 100 per cent synthetic, a combination of synthetic and cotton, or all-cotton makes a difference in expected length of service and in what treatment can be given the hose. FIRE ENGINEERING asked the Du Pont Company to tell fire fighters about these differences. The information presented here is based on a special report from Du Pont's authority on fiber for hose.

It must be borne in mind that the mere specification of 100 per cent synthetic hose, or combinations with cotton, does not in itself insure quality of the final product. In general, 100 per cent synthetic hose is superior, but basic fabric design and other manufacturing considerations are still, as always, the fundamental prerequisites of a quality product.

The Editors

Table 1—Properties of Fire Hose Filler Cord

	Polyester (Filament Yarns)	*Cotton (Spun Yarns)*
Breaking strength, pounds	105	105
Gage, inches	.028	.080

Table 3—Drag Tests on Asphalt Paving*

100% Polyester Fiber	*100% Cotton*
8.2 miles	3.0 miles

* Miles required to expose filler cords by dragging hose on dry asphalt. Test was conducted at 10 miles per hour.

Table 2—Simulated Concrete Abrasion

Test Condition	*100% Polyester* Type of Failure	Cycles	*100% Cotton* Type of Failure	Cycles
Dry	Cords ruptured	1,300	Outer jacket destroyed	420
	Liner exposed	26,700	Liner exposed	8,575
Wet	Tears along edge	5,400	Outer jacket destroyed	560
	Cords ruptured	8,800	Liner exposed	7,900

After soil burial test of 28 days, cotton-jacketed hose (left) had about ¾ inch of soil adhering and 10 different kinds of mold and/or bacterial colonies visible. Sample jacketed with 100 per cent polyester fiber had neither adhering soil nor visible colonies of microorganisms

or if there is a question about the content, the fire chiefs should ask their suppliers for this information.

Specific data on the physical and chemical properties follow:

Strength

Hose reinforcing cords made from polyester filament yarns are about three times as strong as the same size cords spun from cotton. Therefore, fewer or smaller cords are required to attain any desired bursting strength. This is illustrated in Table 1 which gives a comparison of filler cord sizes required for comparable cord strengths.

Abrasion resistance

Laboratory tests have been conducted by the United States Testing Company and Du Pont to determine relative abrasion resistance. The results show hose jacketed 100 per cent with polyester is superior to hose jacketed with cotton.

Comparative weights

Since fewer filler cords per inch or smaller size filler cords of polyester yarn are required for a given bursting strength, the hose weighs less and is more flexible than regular hose. Weights of various comparable quality 2½-inch hose, for example, are:

Hose	*Type*	*Weight Pounds Per Foot*
100% polyester fiber	double jacket	.80
100% polyester fiber	single jacket	.65
100% cotton	double jacket	.90
100% cotton	single jacket rubber coated	1.52
Polyester and cotton	double jacket	.80

Water absorption

Measured under identical conditions, water absorption of polyester is 0.5 per cent while that of cotton is 24 per cent to 27 per cent. Low water absorbency of polyester, combined with low weight per unit of strength, offers reduced weight when the hose is wet as well as shorter drying time.

Microorganism and insect resistance

Soil burial tests, conducted on hose containing all polyester yarns, and hose containing cotton warp (surface) yarns show that polyester has excellent resistance to microorganisms. Specimens were buried in warm, moist soil for 28 days and the hose containing 100 per cent polyester had neither an appreciable amount of adhering soil nor visible colonies of microorganisms. Its ordor was normal.

The cotton hose had about ¾ inch of soil adhering to the jacket, and 10 different kinds of mold or bacterial colonies were visible. The odor associated with decomposing cellulose materials was very strong. Limited tests indicate that polyester has excellent resistance to insects. There is no known instance where insects have damaged the fiber itself.

Chemical resistance

Laboratory tests indicate that the following compounds have little or no effect on the strength of polyester fiber under ordinary conditions of exposure: Acids; alcohols; bleaching agents; dry cleaning solvents; haolgenated hydrocarbons; hydrocarbons; ketones; soaps and synthetic detergents; water, including sea water; weak alkalis. □□

Beware electrical hazards

By CHIEF JAMES M. CALLAWAY*
Myrtle Beach, S. C., Fire Department

UNCONTROLLED ELECTRICITY is more dangerous than a gun in the hands of a maniac. Many professional linemen have been electrocuted working around electricity while it was in a controlled state. It is infinitely more dangerous for a fireman or rescue squadman, unskilled in the handling of electric current, to attempt a rescue, or to attempt to clear a hazardous situation involving uncontrolled electricity.

In most instances when a lineman is called out to work on wires that are down, and where the voltage exceeds that of house current, the current is shut off the damaged circuit until the lines can be repaired. A fireman cannot deenergize a hot circuit. This has to be done by power company personnel.

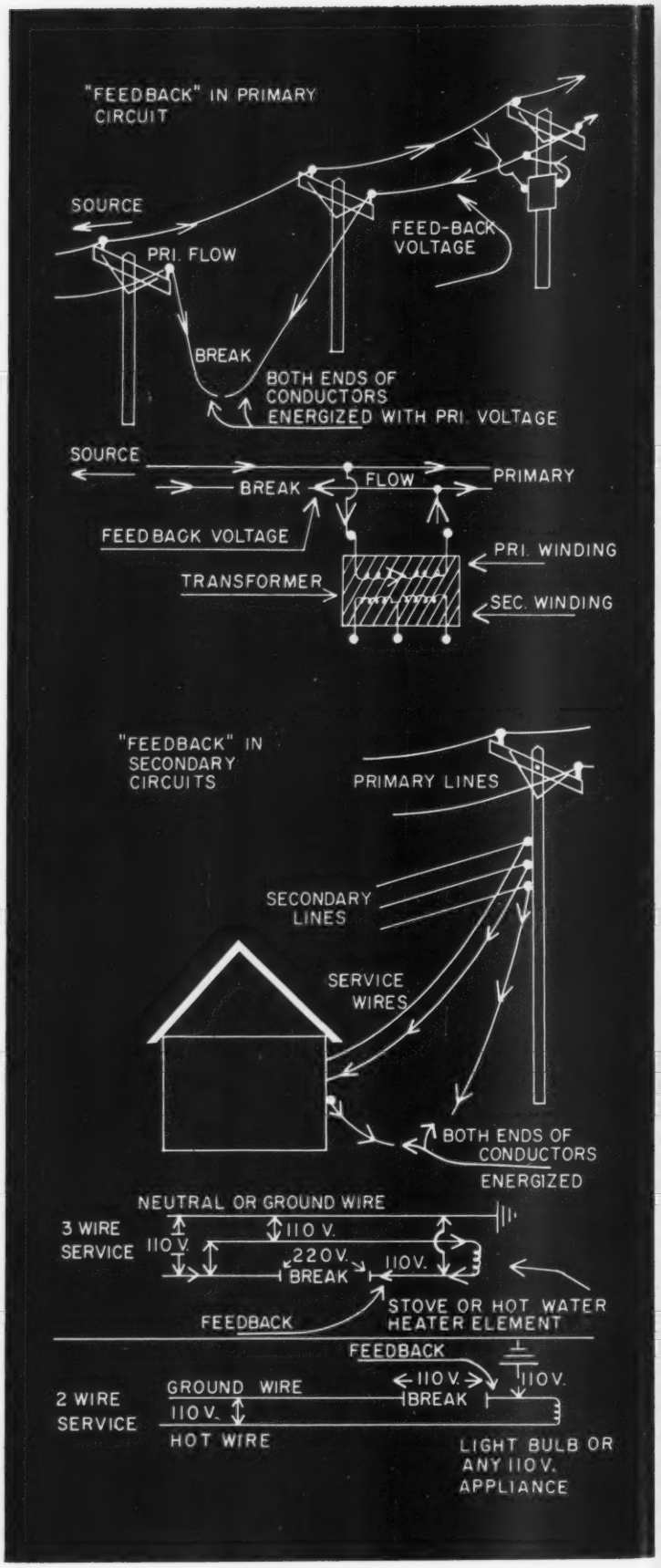
If conditions are such that life can be maintained or saved without having to get in the immediate proximity of energized conductors, the squadman should use all available means to keep himself and others away from fallen wires and objects with which the wires might be in contact. Notify the local power company as soon as possible.

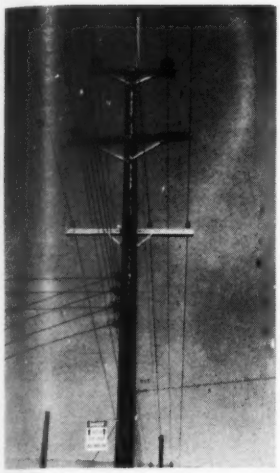
If there is any danger of people coming into contact with energized wires or objects, do not leave the scene, but send someone else to notify the power company. Set up a safety zone around the danger areas and maintain this safety zone until relieved by police or power company personnel. Enlist help from passers-by, if necessary.

General procedures—wires down

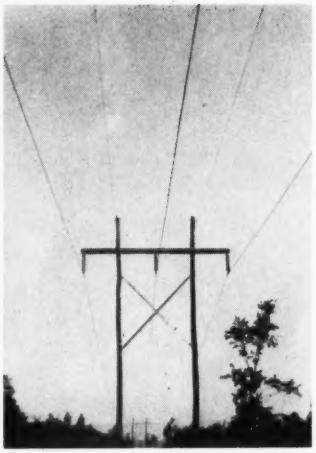
Overhead conductors are usually broken somewhere in a community every time there is a wind or ice storm.

*The author has had many years experience as foreman of an electric company line crew, and as an electrical contractor. All the material included here is condensed from the electrical section, South Carolina Rescue Squad Manual.





Five types of conductors on pole: (From top to bottom) Static shield-grounded conductor; 33 kv on two top cross arms; 4,160 v on third cross arm, secondary conductors and a telephone drop. Sign attached reads: "Danger High Voltage Overhead"



110,000-volt transmission line. Grounded static shield conductors are attached to tip of each pole

During and after extremely bad weather, we all realize that there may be trouble and we are more or less alert for these emergencies.

However, there are other situations which can and do cause overhead conductors to fall. Temperature changes over a period of time can cause a bad connection. The connection then generates enough heat to burn a line apart. Lightning can damage an insulator sufficiently for it to break down days, weeks, or even months later in good weather, burning apart a conductor. Overloaded circuits, faulty material or improper construction, malicious or innocent grounding of conductors with some object such as a chain or a piece of wire, and wrecks involving poles, are but a few of the many conditions which cause wires to fall to the ground.

Even though these conditions are not routine in a well-built distribution system, they are not unusual. When an energized conductor is on the ground, or low enough to be contacted from the ground, an emergency exists.

The question often arises whether or not a line is "hot" and if so, "how hot?" Lines on tops of poles and supported by three or more insulators carry as much as 110,000 volts. Lines supported by one large insulator carry as much as 33,000 volts. These lines are called transmission lines and are not usually built on highway right of ways. However, they do cross highways, and near or in towns and cities they are often located on street or highway rights of way.

Lines which parallel streets and highways and which have transformers on them are called distribution lines. They usually have smaller insulators and the lines are either attached to the top of the pole or on cross arms. They carry voltages varying from 2,300 volts to 13,000 volts and are called primary lines.

The difference between being electrocuted with 2,300 volts and 13,000 volts is comparable to the difference between being shot by a .45-caliber bullet and 90-mm shell. You have a slight chance of surviving a 2,300-volt shock if you have only received a brush or short charge. The chances of surviving higher voltages are practically nil.

Wires running below the primary wires carry voltages used in houses—110-220 volts. You have heard of people who stick fingers into light sockets to see if the current is on, or to show off. When a squadman sees a secondary line, or a service wire down, he should be no less concerned about it than he would be about a primary line. Never forget this fact: More people are killed by 110 volts than all other voltages combined.

Telephone lines are usually strung under secondary lines. These are usually insulated and we might feel that we need not bother about them. In most cases, this assumption is correct, but there is always the possibility that a primary line may be in contact with the telephone line several miles away. This possibility becomes a real threat in bad weather.

There is one other term that should not be left out in any discussion of handling or protecting oneself and others from wires that are down. This term is "feed-back." It is a nasty term even to experienced linemen. To explain it, let us use, for example, service wires leading into a house from a pole. The bottom wire breaks off at the pole. The wire is not feeding from the pole so we may be inclined to think that the line is dead. There are two lines still serving the house. One of these carries 110 volts into the house, where the current uses a water heater or electric stove element as a conductor, and travels out of the house through the downed wire. The downed wire has just as much current in it as the wire in the air. The same thing can happen to primary lines by feeding back through transformers.

The degree of grounding, or short-circuiting, will determine the amount of heat dissipated. If a wire carrying 2,300 volts is lying on grass or dry dirt, a high-resistance ground will result. This means that the resistance between the wire and a physical ground will be so high that little or no current will flow to ground. The grass or dry dirt becomes an insulator.

Looking at this wire, it seems harmless, no smoke or arcing. However, if it is touched by a person who is grounded, a shock or electrocution is the result. How well the person is grounded will determine the degree or amount of shock they will receive.

Volt is a unit of measure for pressure, or the driving force of electricity. Ampere is the working portion, or the heat of electricity. The higher the voltage, the more the current flow. Only one-fifth of an ampere is needed to paralyze and kill a human, if that one-fifth of an ampere passes through the heart. You do not have ammeters and voltmeters with you on emergency calls, so the best thing to do is not to come in direct contact with downed conductors, nor let anyone get close enough to come in contact with one.

In setting up a safety zone around a danger area, people and vehicles should be kept back at least one span from the break. They should not be allowed under overhead conductors because the wires might be loose and the conductor might sag enough to

Continued on page 881

MODERN BADGES . . . combine latest manufacturing

CHANCES ARE, the badge you wear looks pretty much the same as fire badges everywhere. You'd probably be hard-pressed to describe it if you were asked to do so. Yet in many cities and towns, the citizenry looks twice when one of its fire fighters strolls by wearing badges designed exclusively for their departments.

A quiet, colorful revolution in badges has been going on for some time now. Protection authorities, public administrators, and civic boosters alike are happy, for—like many revolutions—this one opens new vistas of opportunity and puts an end to some age-old evils.

A feature of today's strong trend toward new custom-designed badges is the enthusiasm and ability displayed by fire officials themselves in creating designs. All manufacturers, of course, have skilled designing staffs that supply sketches of proposed badges. But men like C. T. McGraw of the Great Lakes Box 15 Club, frequently give the professional artist a big assist. His design for the Box 15 Club, an organization of manufacturers and distributors serving the Great Lakes Division of the International Association of Fire Chiefs, is a distinctive black and red enamel creation featuring an outline map of the Great Lakes district, a fire box enclosing the numerals "15," and a border of fire fighting equipment.

The matter of individuality and instant identification actually involves much more than local pride. Authorities concerned with the various aspects of civil protection stress the value of easy recognition, particularly under emergency conditions. Interestingly enough, this concern for recognition goes back to medieval times, when

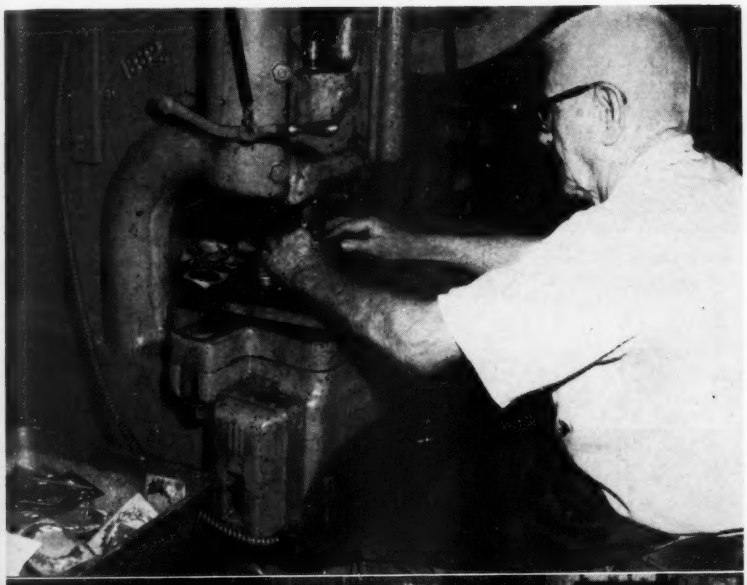
Artist creates distinctive and colorful design. This specialized service is free to any fire chief interested in a special badge for his department

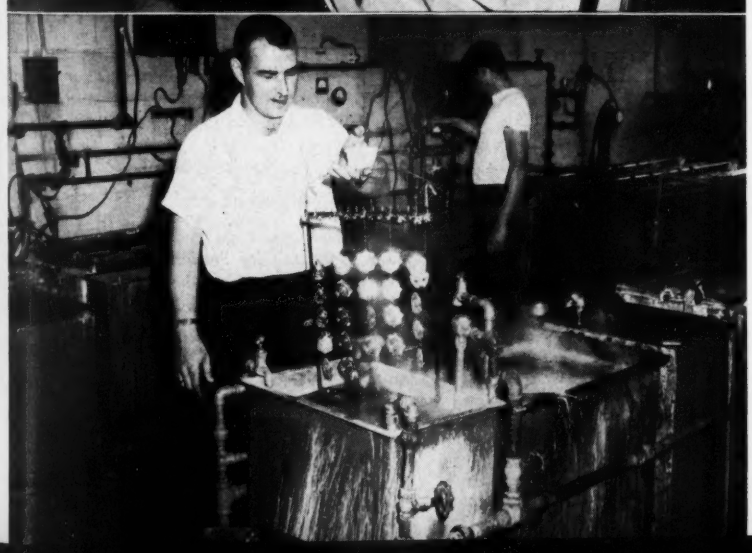
All photos courtesy V. H. Blackinton & Co., Inc.

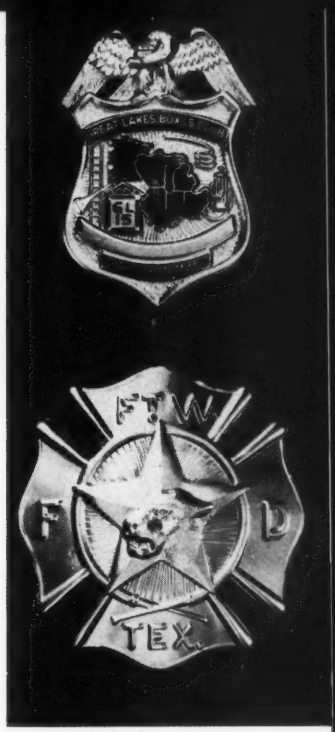
Skilled artisans create the actual badge die by hand cutting every line, every figure, every letter to execute the original design sketch exactly

Huge hydraulic stamping presses strike die impression under tons of pressure

techniques with age-old heraldry







Box 15 Club badge referred to in text. States which make up Great Lakes Division, IAFC, are emphasized with enamel

Simple yet effective badge of Fort Worth, Texas, Fire Department. Combines state and local insignia with traditional fire service symbols

badges as we know them today had their origin.

In 12th Century feudal Germany, personal and family insignia became common. These identifying devices were incorporated on battle dress as a means of quick recognition on the field of combat. The shield, with its heraldic emblems, was reproduced in metal miniatures and worn as an important part of court dress. Rigid rules were prescribed to govern the practice, which spread rapidly into every institution of government and society where group identity was important for practical or ceremonial reasons.

As use became widespread and

Continued on page 836

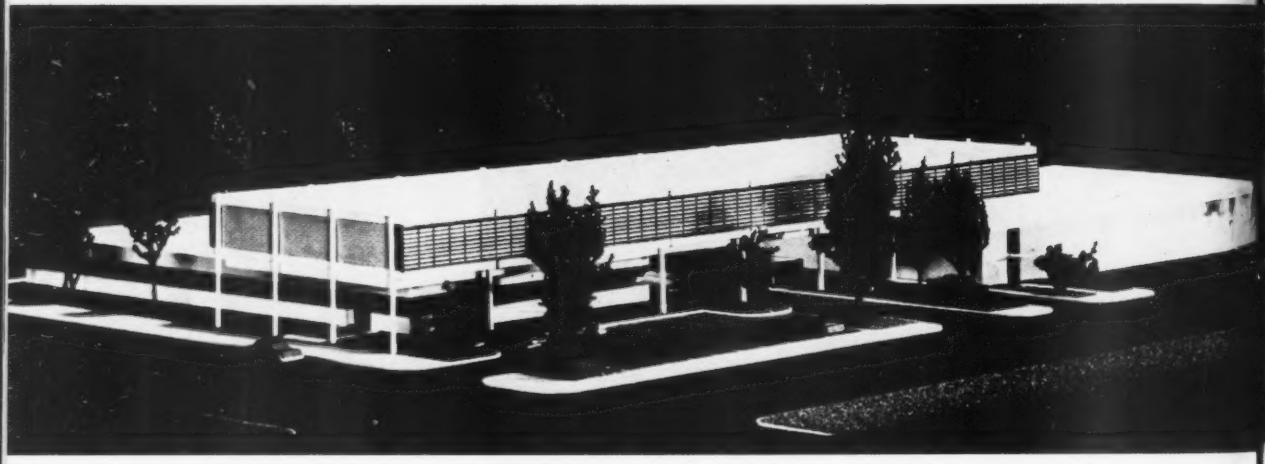
Trimming and blanking operations are by skilled craftsmen who have grown up with the manufacture of fine badges

Nimble fingered workers carefully apply pins, safety catches, seals and other attachments which complete the badge

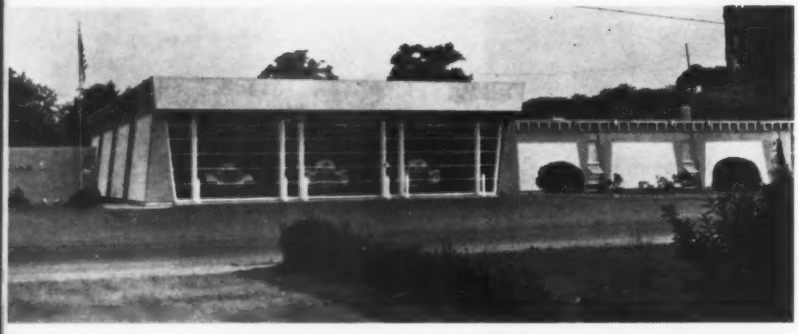
Glittering badges are lifted from electroplating tank. Each badge receives as many as three plating operations to insure long wear and high quality

Coral Gables, Fla., combined fire station, training center and shops. Designed by O. K. Houston Associates, it features folded plate construction of pre-cast concrete. Glass wall of apparatus room is freely suspended from frame —photo by Thibedeau Studio

Pomona, Calif., new $1.5 million Public Safety headquarters will include fire, police, civil defense and communications. Designed by Architect Welton Becket and Associates, the air conditioned structure provides space for 12 or more pieces of apparatus



Current fire station design



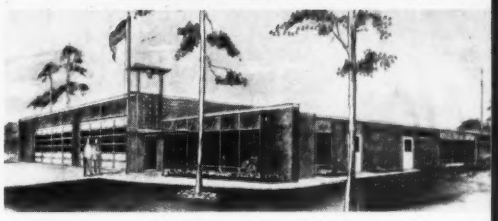
New Haven, Conn., station for Engine No. 5. Located on Woodward Avenue, it serves tank farm storage area and harbor and houses pumper and special foam unit

Los Angeles City Station 71 in Bel Air Section. Built in area where homes range in value to $250,000, it was bitterly fought by residents who now admire it

Official L.A.F.D. photo

Ovid, N. Y., Volunteer Fire Department boasts this magnificent new $400,000 headquarters. Designed by Architect John Ehrlich, it was donated to village by Dr. and Mrs. Walter B. Ford

Tenafly, N. J., Municipal Center, below left, is group of three buildings designed by Vincent G. Kling, F.A.I.A. Includes fire-police headquarters on right, public library at left and borough council chambers in center. Space is provided for seven pieces of apparatus plus drill tower
Photo by Lawrence S. Williams, Inc.



Pittsburg, Kansas, recently built this new air conditioned headquarters station from wall shell of disbanded municipal steam plant. Provides office, living, dormitory and training facilities. Apparatus ramp is fitted with electric heating coils to melt ice and snow in winter (Above, top)
Photo by Parrish Portraits

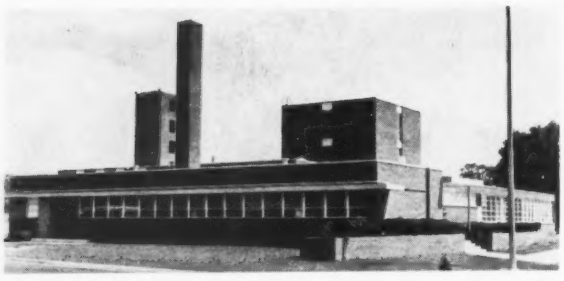
Station No. 2 of Clay Township, Indiana, fire department is under construction. Features drive-through apparatus room with personnel quarters in straight line on right side (Above, bottom)

Station of Engine 14, San Francisco's jet turbine pumper, Battalion 2 and the Arson Squad was designed by Architect Donald Beach Kirby. It is located on Oak Street in the Hayes Valley Section—*official S.F.F.D. photo by Chet Born*

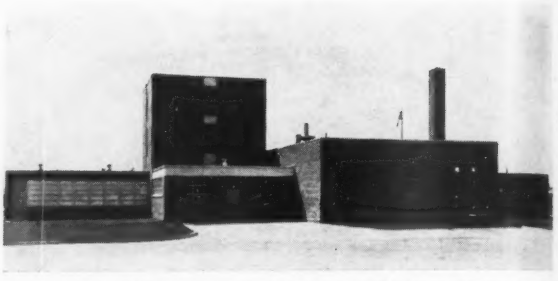
gnsnclude many multi-purpose structures

building boom in fire stations is presently underway
many sections of this country as the fire service strives
keep up with the expanding needs of the citizens.
hile a large majority of the structures
e designed for neighborhood or district protection,
is significant that a number of combination
unicipal buildings are also projected or have been completed.
hose presented here are intended as a cross section,
presentative of the present trend in fire
ation construction and indicate that the nation's
chitects are succeeding in their endeavor
provide working utility with architectural beauty.

District of Columbia Fire Department



Front and side of administration building. Expanse of windows assures light and airy offices and classrooms. Large square area projecting upward is ladder room with a 35-foot ceiling



Rear of the administration building reveals how doors of the engine and truck room and the ladder and appliance room open onto the broad expanse of concrete in training area

THE DISTRICT OF COLUMBIA Fire Department replaced a 33-year-old training school early this year with a million-dollar installation. Dedicated as the "Training Center," this area of 7½ acres is designed to fulfill the training requirements and experimental research of the department.

Located in the outlying section of the District at 4600 Overlook Avenue, S. W., it is surrounded by a 10-foot-high chain link fence for security and protection to the public. Encompassed by this fence is the administration building, drill tower, fire training building, open pits of various sizes and a thermocouple dial house, as well as several different training areas of concrete or macadam. Fifteen 1,000-watt floodlights mounted on 30-foot poles completely light the area for night training.

Administration building

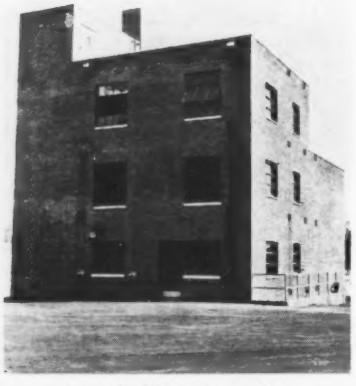
Located within this building is the chief instructor's office (23 by 25 feet), a conference room (11 by 17 feet), instructors' office (16 by 17 feet), students' lounge (16 by 26 feet), a furnace room, an air-conditioner room, several storerooms, and a laboratory (12 by 28 feet). Three fully equipped classrooms are provided: Two general classrooms (28 by 36 feet), and a pump classroom (23 by 39 feet) specially equipped with cut-away pumps and demonstration mock-ups. These classrooms are separated by folding partitions that can be opened to provide an unobstructed area for large groups or special purposes.

A truck and engine room (41 by 80 feet) houses two pumping engines and a 100-foot aerial truck for use in training students at the center. A fire hydrant and a 5,000-gallon drafting cistern are located in this room, together with a vehicle exhaust system so that pumping engines may be used for training indoors during inclement weather.

A gas chamber (10 by 16 feet) provides an enclosed area for the training of firemen in the use of self-contained breathing apparatus. Observation windows in the wall of this chamber allow the instructors to observe the training operations from the truck and engine room. Within the gas chamber is a bi-level crawl tunnel, also with glazed openings, through which the trainees crawl and perform work along its route. In an emergency, a special ventilating system permits a complete change of air in 30 seconds.

A ladder and appliance room (30 by 61 feet) is provided for exhibition of tools and appliances, ladder rack, rope net for the drill tower, fire alarm box system, etc. A 30 by 30-foot portion of this area has a 35-foot ceiling to enable the classes to practice raising all lengths of portable ladders used by the department.

Also within the administration building are two separate locker and toilet facility rooms for instructors and students. Arrangement of lockers and showers permit the use of the instructors' area by eight persons and the students' area by 24 persons.



Fire training building, from the mercantile side, shows the large wall scuppers through which water and debris from training evolutions are removed

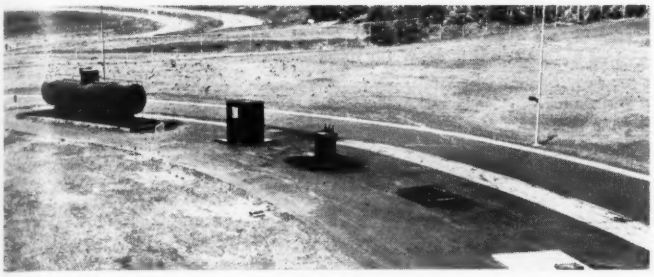
Drill tower and 50,000-gallon cistern, along with surrounding concrete pavement, provides facilities for diversified outside training evolutons

Drill tower

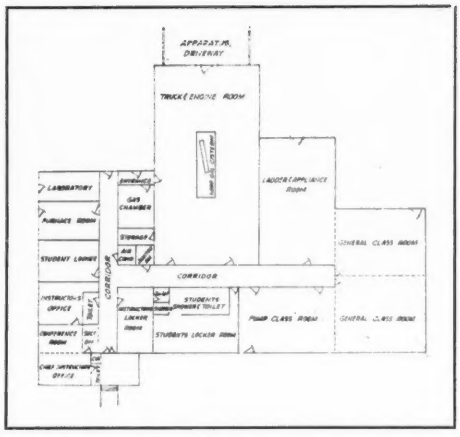
A six-story, 65-foot-high, 17 by 17-foot tower provides an area for hose evolutions, pompiering, and the directing of heavy-duty streams such as wagon pipes, ladder pipes, and moni-

operates new training center

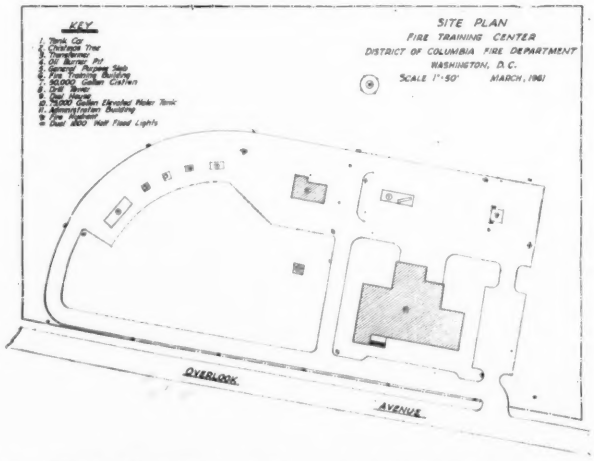
By CHIEF MILLARD H. SUTTON



The open pit area, paved in macadam, with the macadam perimeter roadway in the background—all photos courtesy of District of Columbia Fire Department



Floor Plan
Administration Building



An instructor has a broad view of training area from thermocouple dial house, thereby assuring instant control of all outside operations

tor nozzles. This building has an inside stairway from grade level to the roof, an outside fire escape, and an inside dry standpipe system. Each floor has a drain to allow rapid water runoff.

Fire training building

This building (27 by 51 feet) is constructed of fire-resistant concrete and hard fire brick. It is basically divided into two "sides" by both its architectural aspects and movable steel ribbon partitions. The simulated residential side (26 by 27 feet) has a basement, first and second floors. Here again, movable steel partitions divide each floor into four rooms. These steel partitions, while referred to as movable, are floor to ceiling, bolted into place, and sectionalized so different doorway arrangements can be made. The basement of the residential side contains four oil pits, one in each room, with valving arrangements for fuel intake and water drains. There is an open stairway from the basement to the second floor, and a roof scuttle opening for ventilation problems. At two locations in this area, i.e., the roof, and the first floor, there are areas approximately 2 by 6 feet, fabricated of wooden 2 x 6's so they may be chopped through. Slots in the first and second floors under wooden partitions allow the setting and spread of partition fires.

The simulated mercantile area (26 by 27 feet) has three floors and a penthouse. All floors are open areas not divided by partitions and an enclosed stairway leads from the first floor to the roof. A simulated dumbwaiter shaft extends from the first to the third floor. A complete dry sprinkler system is installed on the first floor, and a complete wet sprinkler system is installed on the second floor. Also rising within the enclosed stairway is a standpipe system, which, through valving, may be made either a wet or dry system. The roof of this side of the building has a skylight, stack vent, a wood "chop through" area, and a steel ladder leading to a penthouse roof and chimney. In the basement under this side of the building, which is protected from the residential basement by a masonry firewall, are the control valves for the sprinkler and standpipe systems, a smoke-making machine, and an oil-burning furnace.

The smoke-making machine is one produced for the meat industry, sawdust burning, and is used for charging the building with smoke. This smoke may be channeled to particular parts or rooms of the building by duct work. The furnace is capable of maintaining a 100-degree differential temperature within the building at the same time the smoke generator is running. Of course, with its highly fire-resistant

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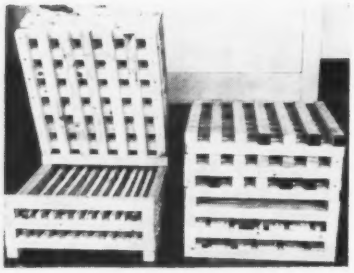


Wood cribs used in test fires. Cribs were specially constructed of three types: Slow, medium, or fast-burning. Upper half of crib was standard. Lower half was built to burn slow or fast

Closeup of typical panel board showing various generic types of detectors. Panel boards were mounted on ceilings and in some cases on walls. Each detector was connected to clock panel

Safeguarding schools from fire

Second Los Angeles test fire series provides further information on protective devices

By PAUL C. DITZEL

RESULTS just published by the National Fire Protection Association on "Operation School Burning No. 2" have been eagerly awaited by the nation's fire service and others interested in school fire safety. As in the earlier report, no recommendations are made, but rather the facts speak for themselves. The report describes 117 test fires set in St. Agnes High School and the Sante Fe High School. These tests were conducted under the direction of Los Angeles Fire Marshal Raymond M. Hill, with Battalion Chief John G. Degenkolb serving as assistant director. An advisory committee assisted.

Nowhere in the fire service does the axiom about the importance of the first few minutes of a fire have deeper meaning than in the case of school fires. In May 1960, members of the Los Angeles Fire Department's Fire Prevention Bureau conducted a number of unannounced tests to determine how much time it takes to evacuate a school building. The tests, carried out in schools of various sizes and configurations, were done under admittedly ideal circumstances: Weather conditions were excellent and classes were in session.

The Los Angeles Fire Department found that it takes about one minute per floor to evacuate a school building. Chief Degenkolb told FIRE ENGINEERING that some school officials claim they can beat this record. But he wonders, as do other fire protection experts, what might happen if conditions are not ideal; If a fire occurs while classes are changing and if weather conditions are poor. How much time will it then take?

Smoke conditions build up

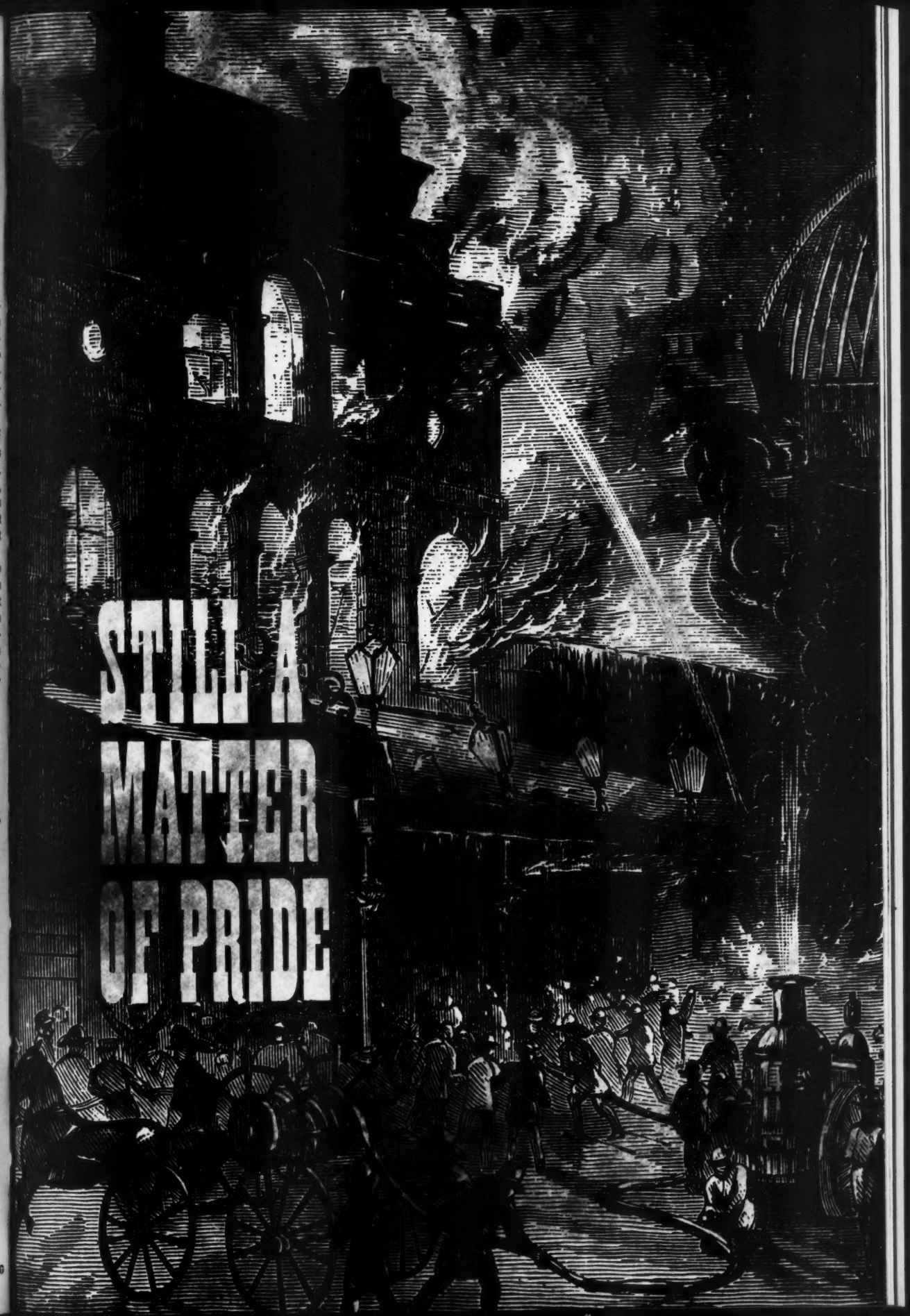
Contrary, perhaps, to popular belief, the major problem in school fire outbreaks is not the flames themselves, as terrifying as they may be to schoolchildren, but the almost unbelievable speed with which smoke conditions build up, especially in multi-story schools with open stairways.

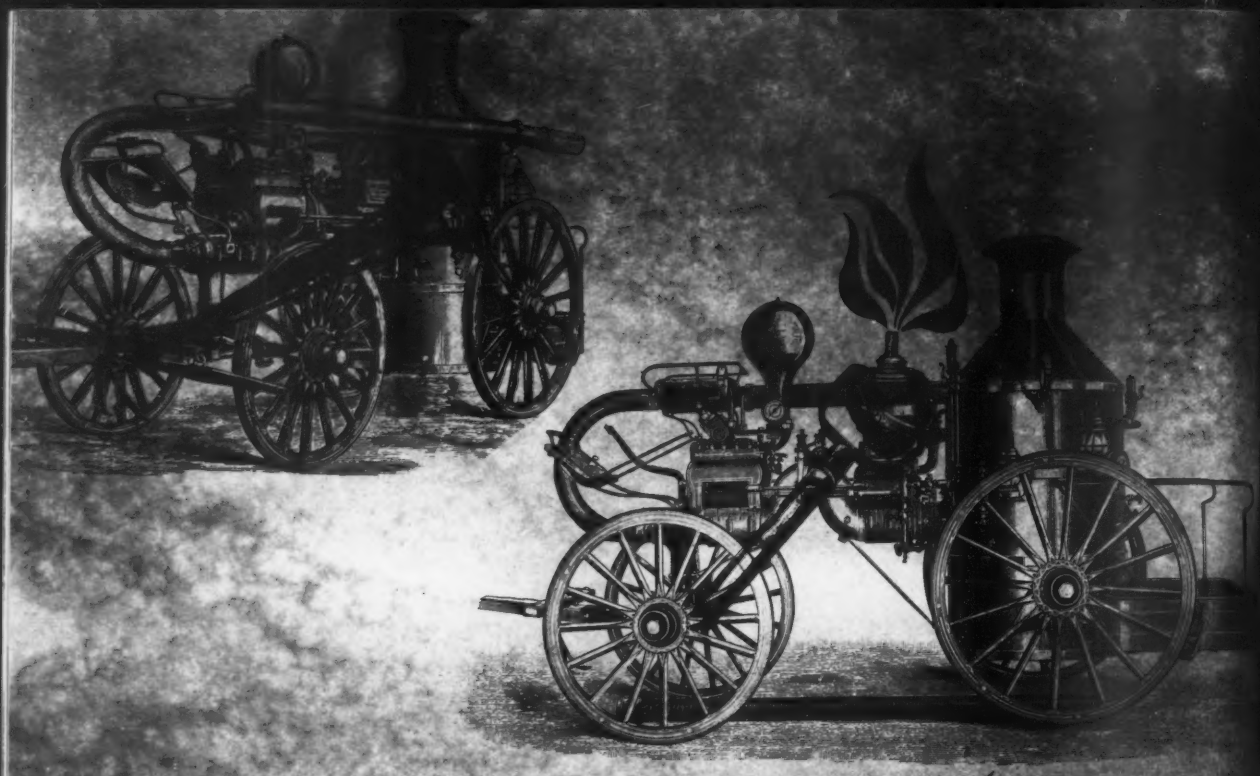
It is pertinent to note that in one of the 117 test fires set by Los Angeles firemen in the open stairway of St. Agnes School building, two firemen, acting as observers, were themselves nearly trapped despite the fact that they knew the fire was going to be set and knew it had been started.

Chiefs Hill and Degenkolb, who have devoted nearly three years to a study of the problem, point out that smoke by itself is not deadly while a school fire is incipient. Rather, the irritant properties in smoke and its power to obscure visibility literally

Continued on page 777

Smoke billows from St. Agnes School soon after test fire is set Untenable smoke conditions built up with incredible speed and in one instance, several Los Angeles firemen were nearly trapped, despite the fact that they themselves had set the fire


STILL A
MATTER
OF PRIDE



There is a pride connected with this "business" of fire fighting. There is an *esprit de corps* among equipment builders as well as fire fighters that has caused some to call it a fraternity rather than a business. Only in the fire service do you find such painstaking care and, at the same time, such rough use of equipment. But, above all, there is a *pride in performance* that has carried over from the golden era of the first hand pumpers and the steamers which followed.

Today as then equipment *must* be dependable. It *has* to perform because there is no time to speculate on its quality when you're at a "big one."

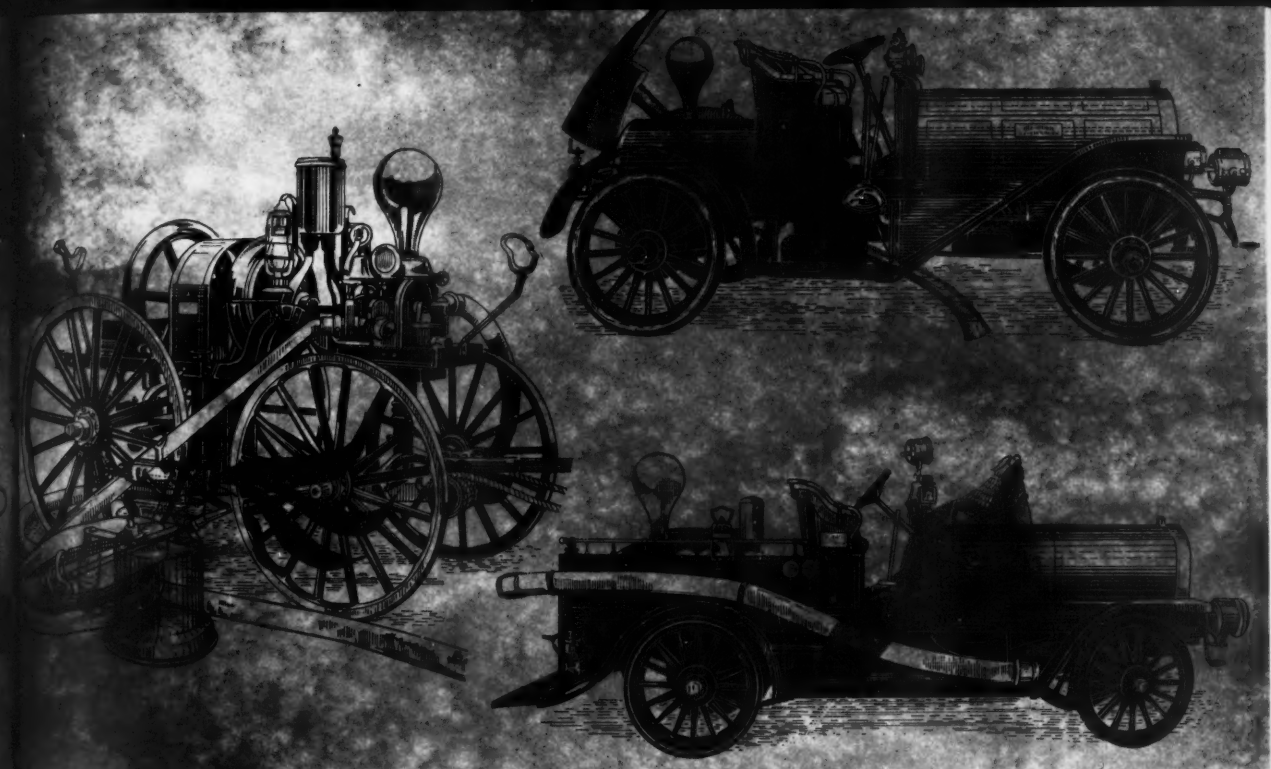
We take pride in the performance and dependability of WATEROUS fire pumps today, just as we were proud of our steamers 75 years ago and our first motorized monsters of 50 years ago. WATEROUS played an important part in the development of dependable fire fighting equipment of today. Perhaps on the occasion of our 75th Anniversary you would forgive a little extra pride and share with us some of these significant developments in the years.

Our size 4 and 5 engines, built about 1886, had a capacity of 400 and 600 gallons per minute, and were for the larger cities. The frame was shaped so that the front wheels could pass under it, permitting the engine to be turned in the smallest possible space. The boiler got up steam so fast that the design was patented.

The first gasoline powered pumper was introduced by WATEROUS in 1898. This was long before the days of spark plugs, and the ignition system for the single cylinder consisted of a hollow plug with a tube which screwed into the combustion chamber. The tube was heated with a blow torch, and as the compression forced the vaporized gas into the tube, the charge was exploded, and the heated tube carried the piston through the exhaust, intake and compression strokes. This internal combustion engine drove a rotary-gear pump.

WATEROUS was first again in 1907 to use a single engine for both propulsion and pumping, and thereby the complete pumper from to pump. This streamlined beauty

1907 to 1918 WATEROUS continued gasoline-engine fire apparatus like They were the first motorized rigs to



see duty in New York City; Washington, D. C.; Bridgeport, Connecticut; Richmond, Virginia, and many [illegible] cities. This was one of the last [illegible] by WATEROUS (engine, transmission, axles, etc.) and delivered to New York City.

After 1918 WATEROUS began to purchase well known commercial chassis, mounting the pumps and [illegible] trucks to fit the demanding needs of fire service.

Between 1915 and 1920 WATEROUS started selling their pumps only to other fire truck builders to mount on their apparatus. This practice became more and more popular until, in 1922, in keeping with the age of specialization, WATEROUS came to the conclusion that it could best serve the fire-fighting fraternity by concentrating on the manufacture of pumps.

After 1922, new model followed new model, each incorporating design improvements. Thousands of these pumps—piston, rotary, and centrifugal—are still performing well after 20 or more years of service.

Then in 1955, after years of design and testing, came a major breakthrough that was to bring a revolutionary change to the fire service—WATEROUS released the first push button fire pump, the CM *Electro-Matic**. Scoffed at and mistrusted by some, the idea of such a pump was welcomed by the majority of fire fighters. And now, after 6 years, there are several thousand WATEROUS *Electro-Matic* pumps proving their dependability in rugged daily use. (See illustrations on last page.)

The *Electro-Matic* principle of using electric automotive motors to power fire pump controls saves you precious seconds in those vital first moments at the scene. Electric power, at finger-tip control, is smooth, sure, and more powerful than manual control.

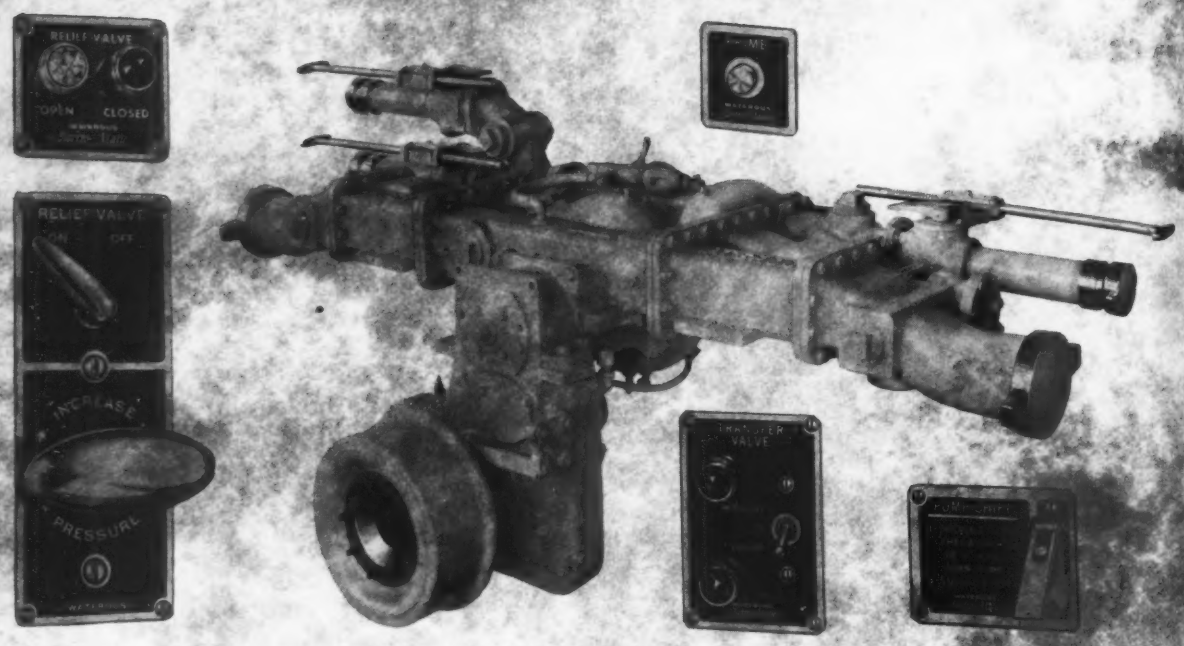
The pump itself is modern in all respects, with a version to fit any engine or drive. It is available in 1, 2, or 3 stage versions, with 8 ratios and 4 different gear case styles to assure precise matching of the pump to any engine or chassis.

Constant mesh helical gears are used in the case for smoother operation.

Oil lubricated ball bearings carry all rotating parts of the main pump.

The CM is *truly* horizontally split. It has only one hydraulic flange, making inspection and maintenance easier.

**Registration applied for*



SHIFT . . .
From road to pump in ½ second in the truck cab without levers or mechanical linkages!

PUSH BUTTON PRIMING . . .
A rotary gear primer (oil lubricated) driven by an electric, automotive-type motor.

TRANSFER VALVE . . .
Up for pressure, down for volume. It operates either way at pump pressures to 285 psi. The change-over is smooth and swift, never sudden. A flick of the switch applies sure, smooth electric power which makes the change-over in 5 to 7 seconds, eliminating surge or pressure "shock." It's maintenance free because there's nothing to lubricate, nothing to clog. Indicating lights show "series" or "parallel" at a glance, day or night.

RELIEF VALVE . . .
Provides accurate control of pump pressure. Optional indicating lights show position of relief valve at all times. One light shows green whenever main valve is closed. When valve begins to bypass, green light goes off and amber light comes on.

(All Electro-Matic controls are available with manual override.)

Still, after 75 years, some things are the same. The promise that goes with each WATEROUS pump is the same as it was in our sales literature of 1886:

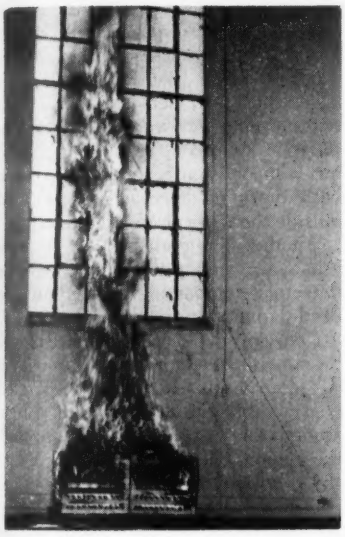
"The workmanship and material used in the manufacture of our products is of the very highest standard known to mechanical art, and approach as near the ideal of perfection as it is well possible to attain!"

If you're a collector or buff . . . we'd be glad to send you free copies of the original woodcuts and descriptions of the 1886 Waterous Steamers Sizes 1-5. The set (4 woodcuts in all) is reproduced on fine paper stock, suitable for framing. Just send a post card to WATEROUS Company, 80 East Fillmore, Dept. 3F17, St. Paul 7, Minnesota, or stop by the WATEROUS booth at the IAFC.

ANNIVERSARY 75 WATEROUS SINCE 1885

WATEROUS COMPANY
80 EAST FILLMORE • ST. PAUL 7, MINNESOTA

Below: Wood cribs (lower foreground) were set afire to test effect of heat on extensive installations of plastic windows. Note thermocouples. Same fire as seen from exterior view is shown in photo at right. Test showed dangers of overuse of plastic windows in extensive areas



Battalion Chief Degenkolb shows start of simulated fire in a janitor's closet

"trap" schoolchildren who, unless quickly rescued, are prey for the lethal heat and gases that inevitably follow.

Shortly after the Our Lady of The Angels parochial school disaster on December 1, 1958, which killed 95 in Chicago, the LAFD, in cooperation with various interested agencies and companies, conducted a new-famous series of 77 tests to determine what happens when a school burns (FIRE ENGINEERING, November 1959). The fires at the condemned Robert Louis Stevenson school suggested a number of other areas for testing.

With the cooperation of many agencies and firms, the Los Angeles Board of Education and the Roman Catholic Archdiocese of Los Angeles teamed up with the LAFD for a new series of tests. The purpose was to study the protection afforded to occupants in open-stairway, multistoried school buildings by automatic fire detection devices made available for these tests and automatic sprinkler systems, as well as other related matters. The test fires were varied and the situations under which they occurred were also varied to be typical of conditions likely to exist in school occupancies.

St. Agnes School was built in 1905 and is a three-story L-shaped brick structure with a full basement. The Sante Fe School was built in 1922, is rectangular and two stories in height with a partial basement. The structural elements of the buildings did not become involved to any extent in the tests.

Only St. Agnes was equipped with fire protection devices, including a complete automatic sprinkler system with standard ½-inch orifice sprinkler heads rated at 165°F. and spaced as recommended by the NFPA for light-hazard occupancies. Only thermocouples were installed in Santa Fe High School.

The advisory committee decided to test one automatic detection device from each generic type. Of 10 types known, only two were not available for the test program.

Types of heat detectors installed were: Fixed-temperature; rate-anticipation, fixed-temperature; pneumatic, rate-of-rise; thermopile, rate-of-rise; and combination rate-of-rise and fixed-temperature. Types of smoke detectors used were: Beam, ionization and refraction.

Also installed at St. Agnes was the following instrumentation: (1) Thermocouples throughout the building. (2) Smoke-density measuring instruments (photoelectric cells) installed across the entrance to each stairway at each floor level. (The light beam was about 5 feet from the floor. Current flow through photoelectric cells was measured at 30-second intervals throughout the tests.) (3) A panel containing 100 clocks. These recorded the operating times of detection devices and the sprinkler alarm valve through a separate panel of 100 relays. All clocks started at the same time by means of a remote control starting switch actuated when the test fire was initiated. Response of individual devices then stopped the clock associated with such devices.

Eight series of test fires

The test fires were grouped into eight series. Half of the fires set at St. Agnes involved three types of white fir cribs. The remaining tests were set to simulate typical school fires as determined from fire inspections, arson and fire investigations, school administration records, and NFPA materials. Firemen-observers were stationed throughout the building and fled only when untenable conditions developed.

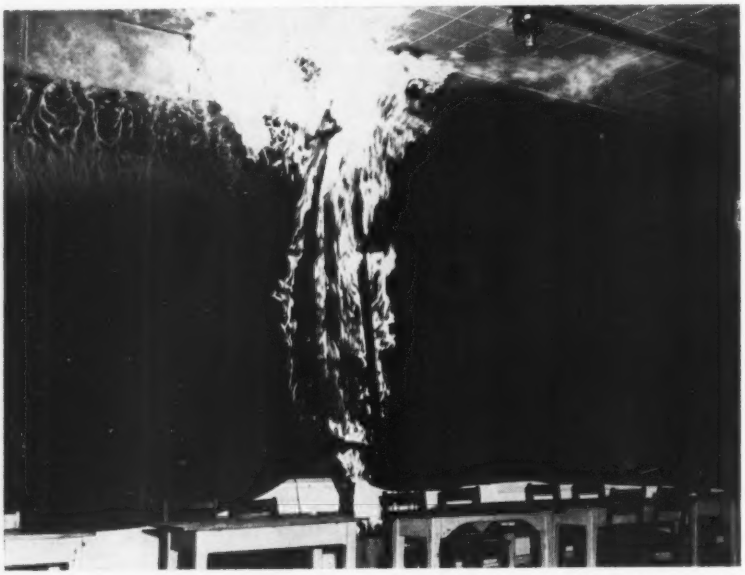
The report makes frequent use of the terms "untenability due to smoke" and "untenability due to heat." The former condition was determined by physical observation and smoke-density measuring instruments. Untenable heat conditions were declared when a temperature reading of 150°F. was reached at a point 5 feet above the floor level of corridors. Throughout the report the yardstick of three minutes maximum for safe evacuation was used.

In the first series of tests, 14 fires

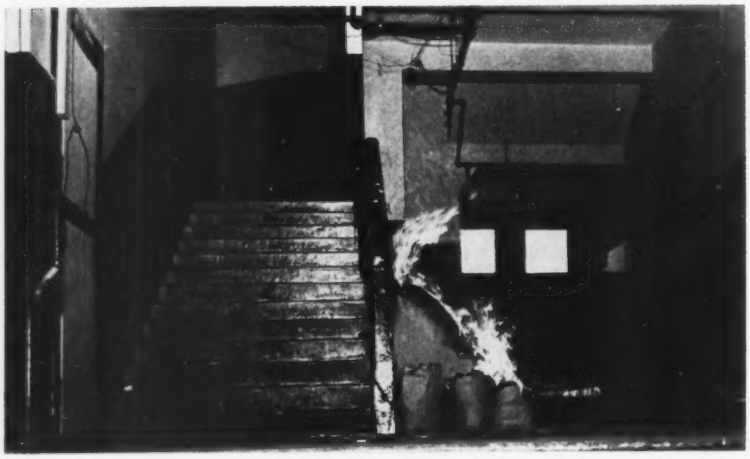
were set to determine if the automatic detection devices tested would respond in time to allow for safe evacuation of the school building. All 14 fires were allowed to burn until untenable conditions were attained or the fire had subsided. The blazes were typical of those that could occur in a school and were set in different locations throughout the building and under various conditions.

"In four of the fires of this series," says the report, "automatic smoke and heat detection devices did not provide an alarm in sufficient time to evacuate the building safely. In these four fires, the untenable conditions within the building developed so rapidly that instantaneous detection would have been inadequate, based upon the criteria of evacuation . . .

"In 10 of the 14 fires," continues the report, "automatic smoke and heat detection devices did provide an alarm in sufficient time to evacuate the building safely. In five of these 10 fires, untenable smoke conditions were developed in corridors and stairways. In each of these fires, however, the detection devices operated with a sufficient margin of time to evacuate the building safely."



Stage curtain blazes as heat and smoke begin to reach detectors (upper right). While flameproofing is required in California, some states do not have such laws. Los Angeles firemen had to wash out flameproofing before test, which was designed for detection equipment. Sprinklers (upper right) were dry



Our Lady of the Angels school fire was simulated in this test as flames involve salvage drive combustibles. Untenable heat and smoke conditions quickly developed. Note detectors and sprinkler especially installed above the fire area

Automatic detectors

Thirty-three fires were set in another series to obtain data on response time of the automatic detectors versus location and spacing, room volume, ceiling height, the effect of ventilation, and various types of fires. The report made these general observations:

"The smoke detectors responded faster than heat detectors when both types of detectors were located within the room or area of fire origin, but did not respond significantly faster when both types of detectors were located outside the room or area of fire origin."

Another observation was that the rate-of-rise and rate-anticipation-type detectors responded faster than the fixed-temperature devices.

"The line-type (pneumatic tubing) rate-of-rise detectors installed with a 'U' loop within each room responded considerably faster than a single straight line of tubing passing through the room." The report observed that the addition of as much as 100 per cent more tubing to the single 'U' loop "did not appreciably speed up" the response time from that obtained by the single loop.

"Both fixed-temperature and rate-of rise-type heat detectors, mounted on side walls 4 inches and 12 inches below the ceiling, responded as fast as similar detectors mounted on the ceiling, 6 inches out from the side wall.

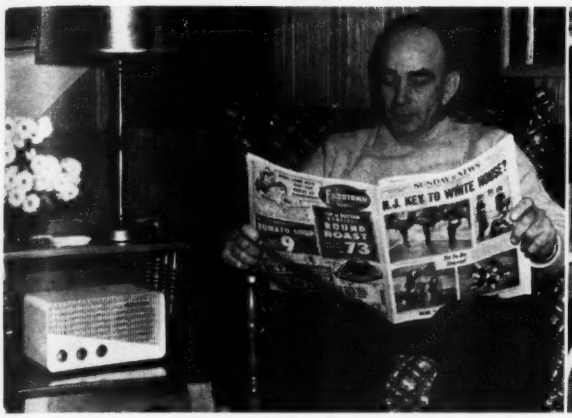
"When located on the side wall 5 feet above the floor, neither fixed-temperature nor rate-of-rise-type heat detectors were of any value in detecting the test fires."

The report also points out that increasing the ceiling height from 11½ to 19 feet and 26½ feet, "resulted in considerably slower response time for all types of detectors."

Of additional interest is the comment that "under draft conditions, the heat detectors responded as rapidly as in closed rooms. Under the same conditions, the smoke detectors reponded more slowly than in closed rooms, though still faster than the heat detectors.

"Reducing the spacing of any given detector to below the maximum recommended by Underwriters Laboratories, Inc., resulted in a faster response time, but the improvement was not significant from the standpoint of life safety."

Continued on page 847



Fire Chief Charles Lamkin relaxes in his living room, confident that his nearby receiver will alert him if he is needed

Sergeant John High of the Cedar Grove Police Department is shown operating the system's base tone generator

—Photos by Warren F. Douglas, courtesy Plectron Corp.

New Jersey town installs "silent alarm systems"

CEDAR GROVE, N. J., in the metropolitan New York area, recently installed a radio tone-alerting receiver in the home of each of the 75 members of its fire department and of the 28 members of the rescue and ambulance services—a total of 103 receivers. The installation was initiated by former Fire Chief Richard Coulter and completed by Chief Charles Lamkin, with the cooperation of Town Manager Kennedy Shaw.

Cedar Grove installed the "Silent Alarm System" because of the lack of adequate audible alarm coverage, and because of the doubt that additional audible alarms would solve the problem. In any event, any plan to install additional audible alarms would have raised difficulties since the town's citizens object to the noise they create in residential areas, particularly at night. Of course, the attempt to improve the alarm system was aimed at improving response of members.

An advantage of the new system is that all men in the area from which the alarm came, respond directly to the alarm with full knowledge of the street address and type of emergency. Obviously, this saves time. Formerly the men had to report to the firehouse first to get this information. Line officers can now report directly to the scene, and sometimes even size up their needs before the equipment arrives. Traffic control is improved since only those persons for whom the information is intended have it. A new member can immediately be equipped with a sure method of alerting him. Under the old system, all emergency personnel in the town were alerted to all calls, whether the particular units were needed or not. This caused some confusion among the services. For example, three out of every four calls received are for the Cedar Grove Rescue and Ambulance units. It is now no longer necessary to disturb the entire complement of men in the fire department if they are not needed on the scene.

An actual fire shows how well the system is working out. A general alarm was received at 8:25 p.m. for a manufacturing plant in the town's industrial park. By 8:26½, the fire chief, a police car and three firemen had arrived at the location. At 8:28, one pumper, 12 firemen and additional police unit had arrived, and lines were being laid. By 8:29, four trucks, 55 men and a rescue truck were on the scene.

This incident demonstrates the quick response possible. The chief and three men were on the scene before the equipment, and directions were ready for the units as they rolled in. Equipment was immediately spotted where needed. As a result, the fire was confined to one vat; five other vats were saved from damage.

Recently, one of the ambulance squad members was credited with saving a child's life by mouth-to-mouth respiration by arriving before the equipment. □□

Chief Lamkin (third from left) accepts his receiver from Fred Engelbrecht, Northeast Communications Company. At extreme left is Ben Timmerman, Plectron engineering staff. Beyond Chief Lamkin, left to right, are: Former Chief Richard Coulter, Deputy Chief Luparella, Lieutenant Sigler and Stan Dufford

Winter adds additional complication to shopping center fires. Here Baltimore County fire fighters stretch lines into position to battle blaze in drugstore-supermarket at Cantonsville

Fighting supermarket fires

By CHIEF EMANUEL FRIED

Hinsdale, Ill., Fire Department

STATISTICS SHOW that supermarkets ranked fourth in the large-loss fires of 1960. When analyzing the major industrial fires for that year, one factor stands out sharply. In almost all instances, the fires started as minor outbreaks, but they were not stopped before they became major losses. The principal reasons were construction weaknesses and absence of automatic protection such as alarm devices and sprinklers.

Technically, supermarkets are not industrial establishments, but certainly the same lessons are apt and apply with equal meaning. To realize the enormity of the potential, one simply has to note the increase in numbers. Reports indicate that 900 shopping centers were built in 1960, adding 75 million square feet to the nation's retail space. This averages out to 77,000 square feet per store.

Most areas where supermarkets spring up are protected by volunteer or small paid departments, or combinations of both. In brief, some of the problems thus created are: Insufficient water supplies to handle fires of this magnitude; departments not familiar with construction defects of such structures; fires will tax resources of any small department to the point where mutual aid is necessary; apparatus from other areas may have to come great distances with resulting delays; roads may be inadequate. In case of a major fire, hundreds of cars may stop to watch and effectively block firemen from getting through, due to lack of sufficient police to handle crowds. There is apt to be little traffic late at night and no pedestrian traffic at all, plus the fact that there is no alarm system. If a motorist saw a fire, he could not report it without great delay.

Handling a supermarket fire

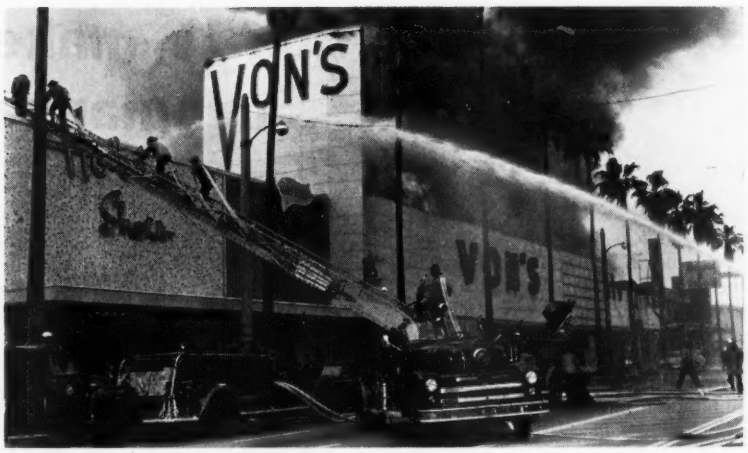
As in most fires, there is an essential difference in handling depending on the time of occurrence, amount of fire, type of occupancy, etc. Many other factors enter into the problem, but the assumption is made here that standard, sound fire fighting tactics will prevail. When discussing supermarkets, it is important to remember that an action which may be correct in the middle of the night can be a serious error in the daytime. For this reason, we will consider a typical fire at each of these periods of time. From these examples, deductions and observations can be made which would be applicable to other supermarket fires. It is assumed for duty assignment purposes that response to the first alarm consists of at least two truck companies and four engines. In areas where this is improbable, the tasks normally carried out by truck companies must be assigned to engine companies.

This is the first of a series of three articles by the author on the subject of supermarkets. "Construction of Supermarkets" and "Inspecting Supermarkets" will appear in subsequent issues. The Editors

Situation sizeup—store closed

A fire occurs at 4 a.m. in the rear utility area. The store is one story, 100 feet by 200 feet without cellar.

Author inspects area where supermarket fire was stopped before burning through roofing paper (arrow). Blaze resulted from short in P. A. speaker



Los Angeles supermarket fire early in 1960 caused injuries to several men. Sudden roof collapse trapped three fire fighters who were rescued after barred windows at rear were pried open—Los Angeles F. D. photo by Manwarren

Volunteer fire fighters from six towns battled this blaze in Half Day, Ill., supermarket. Fire extended into seven adjoining stores

The roof is truss construction of unprotected steel with poured gypsum covering and a 3-foot hanging ceiling. There is a sizeable body of fire and water supply is ample.

Points to consider

The life hazard is not serious except to members of the fire department, indicating need for masks and possible medical aid.

Time of fire and extent indicate delayed discovery. Forcible entry may be necessary, and there is the likelihood of roof involvement and danger of collapse.

The sizeable area of the store will provide ample fuel from structure and contents. Drafts created by large, unbroken areas serve to intensify the fire and aid in rapid spread. Heat conditions will make it difficult to advance lines to the seat of the fire and there will be need for large streams to assure penetration.

Small streams lack cooling capacity and will probably not reach the seat of the fire, causing men to be driven out. Minimum streams in such fires should be from 2½-inch hose with 1⅛-inch nozzles, or combination fog and straight stream nozzles of comparable capacity.

The one-story height is advantageous for ready access to roof via short ladder, for examination and operations including possible opening of roof for ventilation and/or insertion of distributor nozzles. The construction of the roof indicates potential collapse as well as possible extension via side walls if occupancy is part of a group of other stores.

Location, extent of fire

The utilty area is well involved and the rear or side doors are very difficult to force (designed to discourage burglary and usually heavily barred from inside). This indicates a one-sided attack from the front only. Men have to advance directly into smoke and heat (rear of store may be 200 feet from front entrance) and may not be able to proceed under such conditions. Hose streams will most likely hit partitions between main store body and utility area and water damage will be excessive under such conditions.

There is extreme need to force rear doors or breech the rear wall to get lines on the seat of the fire. Where it appears to be a difficult job to gain entrance via the rear, the roof should be opened over the hot spot. Push down the ceiling and insert a distributor nozzle. With adequate manpower on hand both roof and rear door operations should be simultaneous.

Ventilation

Other than by rear doors and roof there is practically no means of venting these stores. Breaking out the front show windows may help some, but may also set up conditions for a smoke explosion. If store is closed up tight and fire has been burning for some time, a heat condition can build up with smoke and gases above their ignition temperature. These gases do not ignite because the mixture is on the "rich" side. Breaking of the front show windows may allow sufficient air to enter and cause the proper mixture to form. A disastrous explosion may occur.

In order to prevent this from happening, feel the show windows. If they are hot to the touch, do not break them and rush men in to advance lines. They may advance just far enough to be caught in an explosion.

Where the windows are hot, open the roof over the fire (make a large, single hole about 8 feet by 10 feet). This will permit the hot smoke and gases to escape. Then have men with lines stand to one side and hit the show windows with a stream. The action of cool water on the heated glass

Continued on page 841

Four tips to make your ambulance service safer

PROVIDING emergency ambulance service has become of increasing importance to many fire departments across the country as they attempt to meet the needs of the citizens and their own members. Such service has its own peculiar requirements and sound basic operating practices may be overlooked inadvertently by otherwise competent officers as they strive to discharge their responsibilities.

For seven years Howard J. Noble has been driving Cincinnati's Life Squad Ambulance No. 1 in all kinds of weather, over 3,800 miles of all kinds of streets, and up and down all kinds of hills. Noble is an official Ohio instructor in life squad techniques for eight counties in the southwestern corner of the state and is a graduate of the Ohio State University emergency rescue course. The course he teaches takes 14 week ends, and squadmen who participate even get experience in a hospital receiving ward. The demand for his instruction is high. Here is his advice gained from arduous experience.

At accident scene, squadmen seek to determine who is most seriously injured, and nature of injuries. Back board, carried flat under cushion of seat in back of ambulance, finds wide use, since many auto accident victims have back injuries

All photos courtesy the Hess and Eisenhardt Co.

Tip No. 1—Beware street corners: You're nearing an intersection with the siren and flasher going, and your injured passenger urgently needs medical attention. You have the right of way. You have every reason to hurry, but take a tip from an expert—the experienced ambulance driver will ease off the accelerator long enough to make sure he can get through the intersection safely.

Tip No. 2—Use an ambulance: While other types of vehicles sometimes must be pressed into service to transport the injured in emergencies, Noble points out that a regular ambulance has a number of advantages. For one thing, it has room to carry oxygen and other needed equipment.

It also affords room to carry more than one patient, makes possible the transportation of cardiac patients in sitting position, and allows space for a squadman to administer to the injured en route to the hospital. This is particularly true of the high-body ambulances now in wide use by life squads. Of 28 life squad vehicles used for transporting injured in Hamilton County (where Cincinnati is located), 25 are ambulances and three are specially equipped station wagons.

"A well-equipped ambulance is extremely important," says Mr. Noble, "but it must be remembered that there's no substitute for know-how and judgment on the part of the men.

"The events you encounter don't change much—the auto accidents, the heart attacks, etc.—but the place and the time make the difference.

Tip No. 3—Use speed with good judgment: "You're thinking ahead, planning your next move. You know which squadman is going to carry which pieces of equipment; this sort of thing is automatic. But even as you arrive on the scene, look to see if there's a way to maneuver the ambulance closer, or back into a driveway—anything to save time and make it easier to load.

"You live constantly with the element of time. From the time a person stops breathing, you have perhaps eight minutes to start resuscitation. Every second counts. But it's always possible to rush too fast. You won't save any lives if you crack up before you get there.

"On the scene, you really have to use judgment. How badly are people hurt—or how sick are they? How far are you from a hospital, and what are the road conditions? You always have to be weighing these factors. If you have a fracture case, you'll splint the victim, and then the speed of the run to the hospital isn't too urgent.

"Or let's say you have a heart attack victim to whom you can talk. You know that when he gets to the hospital he's going to be made to rest completely for weeks. So maybe you'll give him a little oxygen, and then you talk to him. Explain what you're doing, and try to get him relaxed.

"Then, after he's calmed down, you put him in the ambulance. And here's where it's wiser to not use the flasher and the siren. If you start making a fast run, you're really going to make the victim worry.

"On the other hand, if you have a heart case under full resuscitation, or a bad hemorrhaging case, then you

and more effective

An accident report comes in, and the Rossmoyne, Ohio, Volunteer Fire Department Life Squad responds. This department is one which has profited from Ohio program

Cot with patient is rolled into car in high position. Stretcher is hooked in place, and cot is rolled out

En route to hospital, squadman administers oxygen to seriously injured victim. Ambulance carries other injured persons

had better make time. And radio ahead to warn the hospital. Actually, you always have to judge the patient's need, and make your run accordingly."

Noble points out that a loaded ambulance usually will weigh more than 7,000 pounds. This provides a good argument for judicious speeds. "I'm usually within the normal speed limit," he says.

Tip No. 4—Protect your reputation: Even upon arrival at the hospital, the squadman's job isn't quite completed. There are reports to fill out. Also, he stands by while the victim's clothing is removed, and receives all valuables for transfer to the hospital office.

"Always put the valuables in your hat," Mr. Noble says. "There's a sound reason for this. In the first place, you're less likely to drop something. Secondly, it's never necessary to put something in your pocket. If you put something in your pocket, it can get mixed up with your own belongings. Also, it might look suspicious. Just put the stuff in your hat, and you're safe." □□

Squadmen stay with patient until doctor arrives, recording information which may not have been obtained at the scene. Squadman at left is placing patient's belongings in hat, before turning them in to hospital office

SMOKE JUMPERS

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2.

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4.

All photos by E. D. Newcomer

1. Payson Heli-tack crew ready for inspection with field equipment. Men range in age from 18 to 23; foreman is 29. All are expert athletes and tumblers

2. Fire-Jumper Norman Dudley is protected from cuts and most bruises by heavily padded jump suit and wire face mask. Special protective clothing is a must in Heli-tack operations

3. Two-man team of Payson crew responds in helicopter in answer to fire report. Chopper will carry men close to scene of expected operation

4. Pinon pine breaks 15-foot fall of Heli-tack member jumping in area where landing helicopter would be impractical. Rigorous training pays off here

FOREST AREAS, where conditions are hot, dry and explosive, require fast action at the first sign of smoke if a fire is to be successfully contained. To provide the necessary speed, the Forest Service has come to rely heavily on immediate action through the use of Heli-tack crews.

Payson, Ariz., a community of around 1,000 people, is in the heart of such an area. To the west is Bloody Basin and the Tonto National Forest of Zane Grey fame. The Mogollon Rim and Plateau, leading into Sitgreaves National Forest, is to the east, while the Coconino National Forest reaches out from the north.

Now in its second year, the Heli-tack crew at Payson is made up of six men, one acting as foreman of the team. No man goes on any assignment alone, but must travel with a companion. In essence, the team is made up of three pairs of fire fighters. All have been in the area for a considerable time and are familiar with the rugged terrain and the problems.

The normal day for the crew starts around eight in the morning. If fire conditions exist they are up at five. They spend the early hours of every

WITHOUT PARACHUTES!

By RAYMOND ZELESKI

Heli-tack crews provide Forestry Service quick attack in remote areas

day limbering up with a round of calisthenics and running, running, running. Since there are few level stretches in Payson, the running hardens the men for the rugged task ahead. Falling and jumping play important roles in their daily routine and they practice both to allay any possibility of injury. This form of tumbling is in no way associated to athletic events.

As a result, Don Taylor, fire control officer, maintains they are equal to any two men. An amazing feature in training, and one vital to their work, is their ability to go for long stretches without water, a difficult task under normal circumstances and made more so by the extreme heat, smoke and unshaded terrain in many spots.

Value of the physical fitness program is proven by the injury reports. In two years only one man on the Payson crew has been injured. That happened while attempting to set up a helispot in a wilderness area, and the only way to achieve it was to jump. Tumbling from the brush that broke his fall, the man rolled on loose rocks and sprained his ankle.

In the strictest sense of the word, as fire fighters the men are not supposed to stand up and slug it out with any fire. They form the initial attack. Their job is basically to hit the fire area as soon and as close as possible, clean out a helispot, and continue working against the fire until replacements arrive. Sometimes the same pair may hit two or more fires in one day. In each case the maneuver is the same.

The men are tutored in the proper handling of fire tools, fire behavior and fire suppression. Like soldiers on a battlefield, each must know enough about his equipment to field strip it if trouble develops, provide maintenance, reassemble and put it to its best use. Special monthly sessions are held to instruct the new men and to refresh

Continued on page 875

5.

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5. Sensitive equipment is lowered by line to prevent possible damage by landing shock. Fire-Jumper Monroe Bishop waits for chain saw being lowered by George Casner

6. Helicopter Pilot Frank Raye moves chopper in close enough to pinon tree for Foreman Albert Anderson, a veteran jumper, to step off into a broken fall

7. Establishing radio communications with home station is a must on all jumps. Here Ronald Swenson and Mack Perry employ portable radio to contact base station following practice jump

"TRUE NOBLEMEN OF OUR REPUBLIC" . . . thus did a grateful America dub its firefighters a century ago. To symbolize this vigorous heritage of *today's* firefighters, we've mingled the romantic past with the streamlined present. The resulting contrast is apparent in the photo above. The jaunty rig now resides in a museum. And the stiff formal poses are relics of the gaslight era. But the smooth trim lines of the safety and rescue equipment from Mine Safety Appliances Company are strictly '60. And what a difference a complete line makes today. Measured in time or money or precious human lives, the savings are very real indeed. For a demonstration or specific product bulletins contact your local MSA Fire Department distributor. Or write: MINE SAFETY APPLIANCES COMPANY

MSA

Vigilant Hand Pumper courtesy of Carnegie Museum, Pittsburgh

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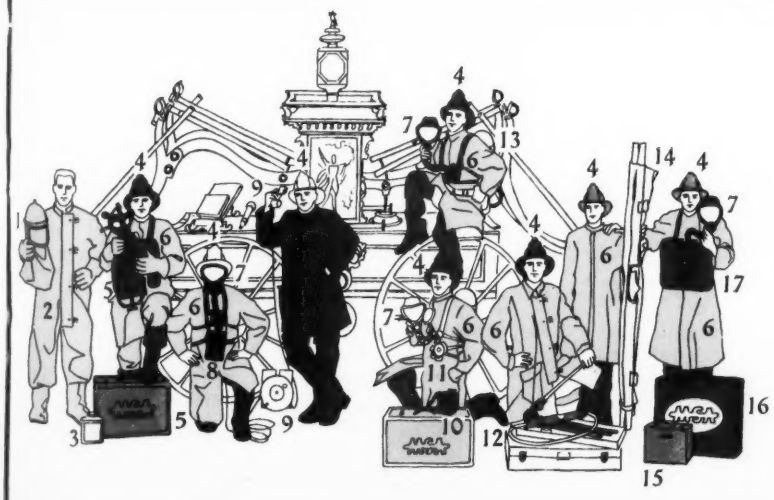


Legend for MSA Products

1. Fire Hood. 2. Fire Approach Suit. 3. Chemox Canister. 4. Streamlined Firemen's Helmets. 5. Chemox Oxygen Breathing Apparatus. 6. Bunker Suits. 7. Clearvue Facepieces. 8. All-Service Gas Mask. 9. Maskfone. 10. Explosimeter. 11. Air-Cub Mask. 12. Porto-Power Rescue Equipment. 13. Demand Air Mask. 14. Stretcher. 15. Foille Burn Kit. 16. Pneolator Resuscitator. 17. Half-Hour Chemox.

Upper: Airlift dry chemical extinguisher mounted on truck. If needed off base, the unit is lifted from a truck and carried to the fire scene by helicopter. To date, 155 of these units are in use at Navy and Marine air facilities

Above: Navy MB-5 aircraft fire fighting and rescue truck for magnesium fires. A new larger unit, the MB-1A, is now being built, and will feature first use of dry chemical in a Navy crash truck, other than portable equipment

U. S. Navy photos courtesy the Ansul Chemical Co.

Trends in Naval crash fire fighting techniques

By CARL F. DREESEN

Fire Protection & Crash Fire Equipment Engineer
Bureau of Naval Weapons
U. S. Navy

NAVAL AIRCRAFT fire fighting and rescue is directed by a branch of the Bureau of Naval Weapons. Under the direction of the author and in cooperation with Dr. Richard L. Tuve and engineers and researchers at the Naval Research Laboratory, Washington, D. C., a continuous research and development program is carried on in a search for more effective extinguishing agents and more exact and accurate techniques in their application. Realizing the importance of the best possible fire fighting and rescue program, this bureau has adopted the theme of "SOP" (Save Our Pilots, Passengers and Planes), and has recently disclosed several new developments toward this end.

The new crash fire truck

Significant developments in the Navy's fire fighting program are spearheaded by the MB-1A crash fire truck, the prototype of which is now being fabricated. When construction is completed, probably in August 1961, this new vehicle will be this bureau's most powerful fire fighting weapon. It will be capable of discharging 6,000 gallons of foam per minute as well as 400 pounds of foam-compatible "Purple K."

This will mark the first use of dry chemical in a Navy crash truck, other than portable equipment. In some instances it is expected that "Purple K" will extinguish the fire before the foam gets into action. The truck will manufacture foam from 1,000 gallons of water and 65 gallons of foam concentrate, carried in separate tanks.

The dry chemical will be expelled through a 1-inch hose line, 100 feet in length and the foam through two turrets atop the truck. The foam range is 175 feet. Hand portable equipment will include two TMB (trimethoxyboroxine) extinguishers, capable of extinguishing fires in burning magnesium.

In appearance, the MB-1A will be similar to the MB-1, but there are several improvements. The engine will be located on the rear axle instead of behind the driver's cab as in the MB-1. The cab will accommodate a crew of five men comfortably, and there will be greater ease of handling and maintenance. The new MB-1A will accelerate from 0 to 60 mph in 50 seconds. In addition, to facilitate the rescue of personnel, the MB-1A will be equipped with an electric power saw for forcible entry into crashed aircraft, as well as a hydraulic rescue kit capable of lifting up to 10 tons.

The smaller Navy crash truck, now in service, is the Type MB-5. This truck carries 400 gallons of water and 11 gallons of foam concentrate and can produce 3,000 gallons of manufactured foam, expelling it to a distance of 175 feet in 1¾ minutes. This truck also carries three 30-pound dry chemical and two 2½-gallon TMB fire extinguishers.

The Bureau of Naval Weapon's emphasis on dry chemical as an extinguishing agent is largely due to the efforts of the author who worked with this agent for some time before joining this bureau in 1954. Formerly dry chemical had not been accepted by the Navy as an extinguishing agent because, when used with foam, stearates in the sodium bicarbonate tended to break down the foam structure and render it less effective.

In 1957, engineers and researchers at the Naval Research Laboratory, working with industry, developed a new foam-compatible dry chemical which proved highly effective in fire fighting and rescue work. This dry chemical is trademarked and marketed under the designation "C-D-C." Preferred technique is to knock down the flames quickly with "C-D-C," permitting rescue teams to enter the fire area to rescue occupants of the plane while foam is being applied to smother the fire in the burning aircraft.

"Purple K" dry chemical

This new dry chemical is a compound of potassium bicarbonate powder (P-K-P) and is claimed to be nontoxic. Trademarked "Purple K" it

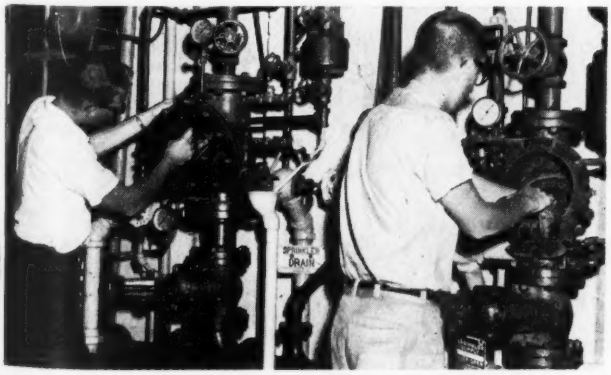
Continued on page 846

Campus fire station houses apparatus and hydraulic labs on the first floor, student living quarters on second and classrooms and library on the third floor

Oklahoma State U. revises fire protection curriculum

By ROGER K. SWEET

Professor R. J. Douglas emphasizes a point during class demonstrations of fire hazard and fire causes



Students set valves of dry-pipe sprinkler systems during laboratory session. Pre-action systems are also studied

STUDENTS ENROLLED in the Department of Fire Protection Technology, headed by Professor R. J. Douglas, in the Technical Institute, Oklahoma State University, Stillwater, will follow an upgraded course of study at the opening of the fall semester, September 1962. The fire protection course was first offered in the School of Technical Training, Oklahoma A & M College, January 1938. Since that time, the name has been changed to The Technical Institute and Oklahoma A & M College is now Oklahoma State University.

The course has been offered continuously except for the period of World War II. Students from 45 of the 50 states have been graduated and are now employed in all except two states. Accredited by the Engineering Council for Professional Development in 1948 and reaccredited after each inspection since that time, it is also approved by the Veterans Administration.

While enrolled in the fire protection course, students are considered volunteer members of the Stillwater Fire Department and, after passing a training course, respond to alarms during off-class hours and get actual experience in fire fighting under the direction of a Stillwater Fire Department officer. Even though only a small fraction of the students are employed as fire fighters after graduation, this activity is considered an important phase of the course. As a volunteer fire fighter, the student is permitted to enter a building involved by fire and is able to learn firsthand: Fire hazards which actually cause many fires; structural behavior under severe fire conditions; speed and direction of fire travel under various conditions; effectiveness of fire doors and other equipment to limit fire spread; importance of good construction, ample water supply, adequate aisles, and proper stock arrangement as an aid in fire fighting; and the advantages and limitations of fire extinguishing equipment including portable extinguishers, fixed systems, sprinklers, inside standpipes and hose lines.

The greatest number of requests for graduates come from fire insurance organizations where about 75 per cent are employed as inspectors, underwriters, or special agents. About 15 per cent are employed by industrial

Continued on page 881

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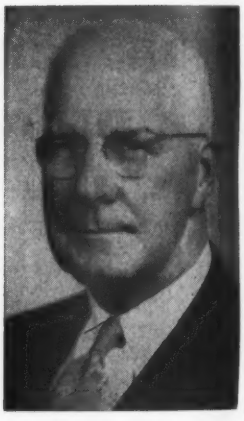

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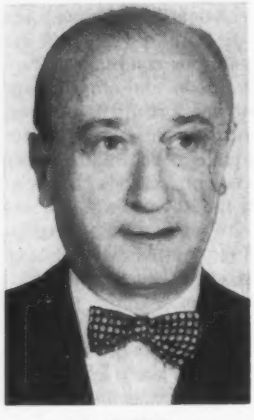

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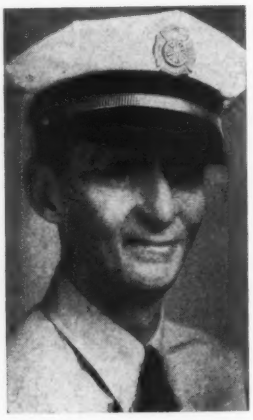

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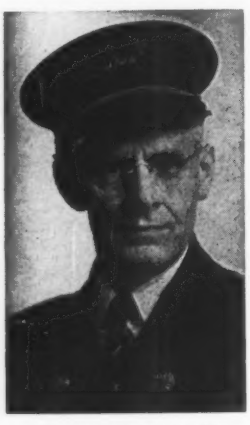

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BUYERS' GUIDE

Directory of Equipment For Fire Departments

This special feature is provided for the guidance and convenience of fire officials and others concerned with the purchase of fire equipment. The companies listed comprise those whose products have recently been advertised in FIRE ENGINEERING and are thus now actively serving the fire protection field. For information on any type of equipment not listed, address Readers' Service Dept., FIRE ENGINEERING, 466 Lexington Avenue, New York 17, N. Y.

Every effort is made to insure the completeness and accuracy of directory sections. However, this information is published as a service, and no guarantee against errors or omissions is expressed or inferred. Additions or corrections are invited at any time. Please address the publisher.

APPARATUS, MOTOR

APPARATUS

Ambulances

Brumbaugh Body Co., Inc.
Challenger Corp., The
Christopher Co., The, Div. International Auto-Industries Corp.
Ford Div., Fleet Sales Dept.
GMC Truck & Coach Div., General Motors Corp.
Gold Crest Safety Equipment Corp.
Hess & Eisenhardt Co.
International Harvester Co., Motor Truck Div.
Miller-Meteor Div., Divco-Wayne Corp.
Scientific Electro Mechanical Industries Corp.

Chassis

Brumbaugh Body Co., Inc.
Crown Coach Corp., Firecoach Div.
Ford Div., Fleet Sales Dept.
FWD Corp.
GMC Truck & Coach Div., General Motors Corp.
International Harvester Co., Motor Truck Div.
Maxim Motor Co.
Pirsch, Peter, & Sons Co.
Seagrave Corporation

Crash Trucks

American LaFrance, Div. Sterling Precision Corp.
Ansul Chemical Company
Bean, John, Div., Food Machinery & Chemical Corp.
Boardman Co., The
Brumbaugh Body Co., Inc.
Christopher Co., The, Div. International Auto-Industries Corp.
Crown Coach Corp., Firecoach Div.
Darley, W. S., & Co.
Ford Div., Fleet Sales Dept.
FWD Corp.
GMC Truck & Coach Div., General Motors Corp.
Gold Crest Safety Equipment Corp.
H. & H. Truck Tank Co., Inc.
Hahn Motors, Inc.
Howe Fire Apparatus Co., Inc.
International Harvester Co., Motor Truck Div.
Kidde, Walter, & Co., Inc.
Mack Trucks, Inc.
Maxim Motor Co.
Morysville Body Works, Inc.
Rockwood Sprinkler Co.
Seagrave Corporation
Universal Fire Apparatus Corp.
Young Fire Equipment Corp.

Foam Trucks

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Boardman Co., The
Brumbaugh Body Co., Inc.
Central Fire Truck Corp.
Christopher Co., The, Div. International Auto-Industries Corp.
Crown Coach Corp., Firecoach Div.
Darley, W. S., & Co.
Ford Div., Fleet Sales Dept.
FWD Corp.
GMC Truck & Coach Div., General Motors Corp.
Gold Crest Safety Equipment Corp.
H. & H. Truck Tank Co., Inc.
Hahn Motors, Inc.
Howe Fire Apparatus Co., Inc.
International Harvester Co., Motor Truck Div.
Maxim Motor Co.
National Foam System, Inc.
Rockwood Sprinkler Co.
Seagrave Corporation
Universal Fire Apparatus Corp.
Young Fire Equipment Corp.

Industrial Trucks (in Plant)

American LaFrance, Div. Sterling Precision Corp.
Ansul Chemical Company
Bean, John, Div., Food Machinery & Chemical Corp. (Self-Propelled & Stationary)
Brumbaugh Body Co., Inc.
Darley, W. S., & Co.
Gold Crest Safety Equipment Corp.
H. & H. Truck Tank Co., Inc.
Howe Fire Apparatus Co., Inc.
Universal Fire Apparatus Corp.
Western Fire Equipment Co.
Young Fire Equipment Corp.

Ladder Trucks, Aerial

American Fire Apparatus Co.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Central Fire Truck Corp.
Darley, W. S. & Co.
Ford Div., Fleet Sales Dept.
FWD Corp.
GMC Truck & Coach Div., General Motors Corp.
Hahn Motors, Inc.
Howe Fire Apparatus Co., Inc.
International Harvester Co., Motor Truck Div.
Mack Trucks, Inc.
Maxim Motor Co.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Universal Fire Apparatus Corp.
Western Fire Equipment Co.
Young Fire Equipment Corp.

Ladder Trucks, Service

American Fire Apparatus Co.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Darley, W. S., & Co.
Ford Div., Fleet Sales Dept.
FWD Corp.
GMC Truck & Coach Div., General Motors Corp.
Gold Crest Safety Equipment Corp.
H. & H. Truck Tank Co., Inc.
Howe Fire Apparatus Co., Inc.
International Harvester Co., Motor Truck Div.
Mack Trucks, Inc.
Maxim Motor Co.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Universal Fire Apparatus Corp.
Western Fire Equipment Co.
Young Fire Equipment Corp.

Pumpers And Hose Cars

American Fire Apparatus Co.
American LaFrance, Div. Sterling Precision Corp.
Ansul Chemical Company
Bean, John, Div., Food Machinery & Chemical Corp.
Boardman Co., The
Brumbaugh Body Co., Inc.
Central Fire Truck Corp.
Christopher Co., The, Div. International Auto-Industries Corp.
Crown Coach Corp., Firecoach Div.
Darley, W. S., & Co.
Ford Div., Fleet Sales Dept.
FWD Corp.
GMC Truck & Coach Div., General Motors Corp.
Gold Crest Safety Equipment Corp.
H. & H. Truck Tank Co., Inc.
Hahn Motors, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mack Trucks, Inc.
Maxim Motor Co.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Universal Fire Apparatus Corp.
Valley Fire Truck Co.
Western Fire Equipment Co.
Young Fire Equipment Corp.

Pumpers, High Pressure Fog

American Fire Apparatus Co.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Boardman Co., The
Brumbaugh Body Co., Inc.
Central Fire Truck Corp.
Christopher Co., The, Div. International Auto-Industries Corp.
Crown Coach Corp., Firecoach Div.
Darley, W. S., & Co.
Ford Div., Fleet Sales Dept.
FWD Corp.
GMC Truck & Coach Div., General Motors Corp.
Gold Crest Safety Equipment Corp.
H. & H. Truck Tank Co., Inc.
Hahn Motors, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
International Harvester Co., Motor Truck Div.
Mack Trucks, Inc.
Maxim Motor Co.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Universal Fire Apparatus Corp.
Young Fire Equipment Corp.

Rescue and Squad Trucks

American Fire Apparatus Co.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Boardman Co., The
Brumbaugh Body Co., Inc.
Christopher Co., The, Div. International Auto-Industries Corp.
Crown Coach Corp., Firecoach Div.
Darley, W. S., & Co.
Divco Truck Div., Divco-Wayne Corp.
Ford Div., Fleet Sales Dept.
FWD Corp.
Gerstenslager Co., The
GMC Truck & Coach Div., General Motors Corp.
Gold Crest Safety Equipment Corp.
Grove Mfg. Co.
H. & H. Truck Tank Co., Inc.
Hahn Motors, Inc.
Howe Fire Apparatus Co., Inc.
International Harvester Co., Motor Truck Div.
Mack Trucks, Inc.
Maxim Motor Co.
Miller-Metror Div., Divco-Wayne Corp.
Morysville Body Works, Inc.
Pirsch, Peter, & Sons Co.
Scientific Electro Mechanical Industries Corp.
Seagrave Corporation
Universal Fire Apparatus Corp.
Western Fire Equipment Co.
Young Fire Equipment Corp.

Tank Trucks

American Fire Apparatus Co.
American LaFrance, Div. Sterling Precision Corp.
Baughman Mfg. Co.
Bean, John, Div., Food Machinery & Chemical Corp.
Boardman Co., The
Brumbaugh Body Co., Inc.
Central Fire Truck Corp.
Christopher Co., The, Div. International Auto-Industries Corp.
Crown Coach Corp., Firecoach Div.
Darley, W. S., & Co.
Ford Div., Fleet Sales Dept.
FWD Corp.
GMC Truck & Coach Div., General Motors Corp.

Tank Trucks (Continued)

Gold Crest Safety Equipment Corp.
H. & H. Truck Tank Co., Inc.
Hahn Motors, Inc.
Howe Fire Apparatus Co., Inc.
International Harvester Co., Motor Truck Div.
Mack Trucks, Inc.
Maxim Motor Co.
Morysville Body Works, Inc.
National Foam System, Inc.
Pirsch, Peter, & Sons Co.
Universal Fire Apparatus Corp.
Western Fire Equipment Co.
Young Fire Equipment Corp.

Towers, Hydraulic

Brumbaugh Body Co., Inc.
Crown Coach Corp., Firecoach Div.
Ford Div., Fleet Sales Dept.
FWD Corp.
Hahn Motors, Inc.
International Harvester Co., Motor Truck Div.
Mack Trucks, Inc.
Mobile Aerial Towers, Inc.
National Foam System, Inc.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Snorkel Fire Equipment Co.
Western Fire Equipment Co.
Young Fire Equipment Corp.

Utility and Repair Trucks

Boardman Co., The
Brumbaugh Body Co., Inc.
Christopher Co., The, Div. International Auto-Industries Corp.
Ford Div., Fleet Sales Dept.
FWD Corp.
GMC Truck & Coach Div., General Motors Corp.
H. & H. Truck Tank Co., Inc.
Hahn Motors, Inc.
International Harvester Co., Motor Truck Div.
Morysville Body Works, Inc.
Scientific Electro Mechanical Industries Corp.
Western Fire Equipment Co.

ALTERNATORS, AUTOMOTIVE

Brumbaugh Body Co., Inc.
Crown Coach Corp., Firecoach Div.
Darley, W. S., & Co.
Electric Autolite Co.
Ford Div., Fleet Sales Dept.
Leece-Neville Co., The

BATTERIES APPARATUS

Crown Coach Corp., Firecoach Div.
Darley, W. S., & Co.
Pacific Marine Supply Co.

BATTERY CHARGERS

Darley, W. S., & Co.
Howe Fire Apparatus Co., Inc.
Onan Div., Studebaker-Packard Corp.
Pacific Marine Supply Co.
Russell Fire Equipment, Div. Russell Uniform Co.

BRAKE, LOCK, HYDRAULIC

Howe Fire Apparatus Co., Inc.

ENGINES (Diesel or Gas)

American LaFrance, Div. Sterling Precision Corp.
Continental Motors Corp.
Crown Coach Corp., Firecoach Div.
Ford Div., Fleet Sales Dept.
GMC Truck & Coach Div., General Motors Corp.
Hercules Motors Corp.
Pacific Marine Supply Co.
Waukesha Motor Company

GENERATORS, AUTOMOTIVE

Crown Coach Corp., Firecoach Div.
Leece-Neville Co., The

HARDWARE FOR APPARATUS

Akron Brass Mfg. Co., Inc.
Crown Coach Corp., Firecoach Div.
Ellcon-National (hand straps)
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Seagrave Corporation
Universal Fire Apparatus Corp.
Western Fire Equipment Co.

LADDERS, AERIAL

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Darley, W. S., & Co.
FWD Corp.
Grove Mfg. Co.
Howe Fire Apparatus Co., Inc.
Maxim Motor Co.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Sponco Aerial Ladder Co.
Western Fire Equipment Co.

POWER STEERING, HYDRAULIC

Crown Coach Corp., Firecoach Div.
Garrison Mfg. Co., Inc.

SEAT BELTS

Atlas Safety Equipment Co., Inc.
Bullard, E. D., Co.
Crown Coach Corp., Firecoach Div.
Ford Div., Fleet Sales Dept.
Mine Safety Appliances Company
Rose Mfg. Co.
Rupert Parachute Co.

SIGNS & EMBLEMS, APPARATUS

Central Fire Truck Corp.
Darley, W. S., & Co.
Everson-Ross Co., Inc.
Gold Crest Safety Equipment Corp.
Greenberg's, M., Sons
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Pacific Reflex Signs
Reese, S. H.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

TACHOMETERS

Sun Electric Corp.

TESTING EQUIPMENT

Sun Electric Corp.

TRANSMISSIONS—DIFFERENTIALS

Dana Corp.
Detroit Automotive Products

WARNING DEVICES, APPARATUS

Bells

American LaFrance, Div. Sterling Precision Corp.
Autocall Co.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Central Fire Truck Corp.
Crown Coach Corp., Firecoach Div.
Darley, W. S., & Co.
Greenberg's, M., Sons
H. & H. Truck Tank Co., Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Morysville Body Works, Inc.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Seagrave Corporation
Universal Fire Apparatus Corp.
Western Fire Equipment Co.
Young Fire Equipment Corp.

Flashers

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Carpenter Manufacturing Co.
Central Fire Truck Corp.
Darley, W. S., & Co.
Dietz, R. E., Co.
Federal Sign & Signal Corp.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Macchi & Company
Morysville Body Works, Inc.
Russell Fire Equipment, Div. Russell Uniform Co.
Sireno Signal Mfg. Corp.
Sterling Siren Fire Alarm Co., Inc.
Trippe Mfg. Co.
U-C Lite Manufacturing Co.
Western Fire Equipment Co.
Whelen Engineering Co., Inc.

Horns

Grover Products Co.

Lights

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Carpenter Manufacturing Co.
Central Fire Truck Corp.
Darley, W. S., & Co.
Dietz, R. E., Co.
Federal Sign & Signal Corp.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Morysville Body Works, Inc.
North American Signal Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Sireno Signal Mfg. Corp.
Trippe Mfg. Co.
U-C Lite Manufacturing Co.
Western Fire Equipment Co.
Whelen Engineering Co., Inc.

Sirens

American LaFrance, Div. Sterling Precision Corp.
Antrex Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Camcone Products, Inc.
Central Fire Truck Corp.
Darley, W. S., & Co.
Federal Sign & Signal Corp.
Fyr-Fyter Electronic Alarm Corp.
Fyr-Fyter Co., The
Grover Products Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Macchi & Co. (Flashers for Sirens)
North American Signal Co.
Pacific Marine Supply Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Sireno Signal Mfg. Corp.
Snyder, M. L., & Son, Inc.
Sterling Siren Fire Alarm Co., Inc.
Western Fire Equipment Co.

Traffic Control, Radio

Rad-O-Lite, Inc.

Whistles

Brumbaugh Body Co., Inc.
Darley, W. S., & Co.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Western Fire Equipment Co.

BOATS, FIRE

BOATS

Pacific Marine Supply Co.

ENGINES, DIESEL OR GAS

Continental Motors Corp.
Pacific Marine Supply Co.
Waukesha Motor Company

OUTBOARD MOTORS

Pacific Marine Supply Co.
Rad-O-Lite, Inc.

RADAR EQUIPMENT

Pacific Marine Supply Co.

CLOTHING

CLOTHING, PROTECTIVE

Aluminized, Insulated

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fyrepel Products, Inc.
Globe Manufacturing Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Janesville Apparel Co.
Midwestern Safety Mfg. Co.
Mine Safety Appliances Company
Minnesota Mining & Mfg. Co. (Fabrics)
Morning Pride Mfg. Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.
Wheeler Protective Apparel, Inc.

Asbestos

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Fyrepel Products, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Company
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.
Wheeler Protective Apparel, Inc.

Belts and Suspenders

Alb Rubber Co.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Globe Manufacturing Co.
Howe Fire Apparatus Co., Inc.
Janesville Apparel Co.
Midwestern Safety Mfg. Co.
Morning Pride Mfg. Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

Boot Calks

Bean, John, Div., Food Machinery & Chemical Corp.
Hood Industrial Footwear & Gloves, Div. The B. F. Goodrich Co.
Norlund, O. A., Co., Div. Mann Edge Tool Co.

Boots

American LaFrance, Div. Sterling Precision Corp.
Beacon Falls Rubber Footwear
Bean, John, Div., Food Machinery & Chemical Corp.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Fyrepel Products, Inc.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Footwear & Flooring Co., Div. The B. F. Goodrich Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Janesville Apparel Co.
Midwestern Safety Mfg. Co.
Mine Safety Appliances Company
Russell Fire Equipment, Div. Russell Uniform Co.
Schneck Textile Fibre Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

Face Shields

Plectron Corp.

Gloves

Bean, John, Div., Food Machinery & Chemical Corp.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Edmont Glove Co. (Edmont Inc.)
Fyrepel Products, Inc.
Fyr-Fyter Co., The
Globe Manufacturing Co.
Goodall Rubber Co.
Goodrich, B. F., Footwear & Flooring Co.
Halprin Supply Co.
Hood Industrial Footwear & Gloves, Div. The B. F. Goodrich Co.
Howe Fire Apparatus Co., Inc.
Midwestern Safety Mfg. Co.
Mine Safety Appliances Company
Morning Pride Mfg. Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Schneck Textile Fibre Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.
Wheeler Protective Apparel, Inc.

Goggles

Bean, John, Div., Food Machinery & Chemical Corp.
Bullard, E. D., Co.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Company
Western Fire Equipment Co.

Hats

Alb Rubber Co.
Bean, John, Div., Food Machinery & Chemical Corp.
Bullard, E. D., Co.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Fyrepel Products, Inc.
Globe Manufacturing Co.
Goodall Rubber Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Midwestern Safety Mfg. Co.
Mine Safety Appliances Company
Plectron Corp.
Reese, S. H.
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.
Wheeler Protective Apparel, Inc.

Helmets

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Bullard, E. D., Co.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Fyrepel Products, Inc.
Goodall Rubber Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Midwestern Safety Mfg. Co.
Mine Safety Appliances Company
Mobay Chemical Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.
Wheeler Protective Apparel, Inc.

Innersoles

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Goodall Rubber Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Janesville Apparel Co.
Mine Safety Appliances Company
Russell Fire Equipment, Div. Russell Uniform Co.
Schneck Textile Fibre Co.
Western Fire Equipment Co.

Rubber and Canvas Coats

Alb Rubber Co.
American LaFrance, Div. Sterling Precision Corp.
Beacon Falls Rubber Footwear
Bean, John, Div., Food Machinery & Chemical Corp.
Body Guard Mfg. Co.
Cairns & Bro., Inc.
Central Fire Truck Corp.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co. (rubber)
Fyr-Fyter Co., The
Globe Manufacturing Co. (canvas)
Goodall Rubber Co.
Goodrich, B. F., Industrial Products Co., Div. B. F. Goodrich Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Janesville Apparel Co.
Midwestern Safety Mfg. Co.
Mine Safety Appliances Company
Morning Pride Mfg. Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Schneck Textile Fibre Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

Skin Diving

Goodrich, B. F., Footwear & Flooring Co., Div. The B. F. Goodrich Co.

Suits, Quick Hitch

Alb Rubber Co.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Body Guard Mfg. Co.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Globe Manufacturing Co.
Halprin Supply Co.
Janesville Apparel Co.
Midwestern Safety Mfg. Co.
Mine Safety Appliances Company
Morning Pride Mfg. Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

MATERIAL (UNIFORM)

Bean, John, Div., Food Machinery & Chemical Corp.
Russell Fire Equipment, Div. Russell Uniform Co.

WEARING APPAREL, DRESS

Hats and Caps, Uniform

Bancroft Cap Co.
Bean, John, Div., Food Machinery & Chemical Corp.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Halprin Supply Co.
Reese, S. H. (Caps)
Russell Fire Equipment, Div. Russell Uniform Co.
Wentworth-Forman Co., Inc.

Shirts, Uniform

Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Russell Fire Equipment, Div. Russell Uniform Co.

Uniforms

Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Russell Fire Equipment, Div. Russell Uniform Co.

Woolen Socks and Mitts

Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Morning Pride Mfg. Co.

COMMUNICATIONS

ALARM SYSTEMS

Alerting

American Fire Alarm Co., Inc.
American Telephone & Telegraph Co.
Antrex Corp.
Darley, W. S., & Co.
Electronics Div., Hobby Enterprises, Inc.
Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.
Fyr-Fyter Co., The
Fyr-Fyter Electronic & Alarm Corp.
Gamewell Company
Hobby Enterprises, Inc.
Minneapolis-Honeywell Regulator Co.
Notifier Corp.
Plectron Corp.
Russell Fire Equipment, Div. Russell Uniform Co.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Scientific Electro Mechanical Industries Corp.
Scott Aviation Corp.
Trippe Mfg. Co.

Automatic

American District Telegraph Co.
American Fire Alarm Co., Inc.
Autocall Co.
Darley, W. S., & Co.
Falcon Alarm Co., Inc.
Fire Lite Alarms, Inc.
Fyr-Fyter Co., The
Fyr-Fyter Electronic & Alarm Corp.
Gamewell Company
Grinnell Co.
Halprin Supply Co.
Kidde, Walter, & Co., Inc.
Minneapolis-Honeywell Regulator Co.
Notifier Corp.
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Safa Alarm Div., Fyr-Fyter Co., The
Snyder, M. L., & Son, Inc.

Batteries

American Fire Alarm Co., Inc.
Burgess Battery Co., Div. Servel, Inc.
Carpenter Manufacturing Co.
Fire Lite Alarms, Inc.
Fyr-Fyter Co., The
Fyr-Fyter Electronic & Alarm Corp.
Gamewell Company
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Boxes

American Fire Alarm Co., Inc.
Autocall Co.
Darley, W. S., & Co.
Federal Sign & Signal Corp.
Fire Lite Alarms, Inc.
Fyr-Fyter Co., The
Fyr-Fyter Electronic & Alarm Corp.
Gamewell Company
Notifier Corp.
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Cable

Fire Lite Alarms, Inc.
Fyr-Fyter Co., The
Gamewell Company
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Central Station

American District Telegraph Co.
Federal Sign & Signal Corp.
Fire Lite Alarms, Inc.
Fyr-Fyter Co., The
Fyr-Fyter Electronic & Alarm Corp.
Gamewell Company
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Scientific Electro Mechanical Industries Corp.

Home

American Fire Alarm Co., Inc.
Antrex Corp.
Falcon Alarm Co., Inc.
Fire Lite Alarms, Inc.
Gamewell Company
Halprin Supply Co.
Holiday Co.
Kidde Ultrasonic & Detection Alarms, Div. Walter Kidde & Co., Inc.
Notifier Corp.
Plectron Corp.
Russell Fire Equipment, Div. Russell Uniform Co.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Snyder, M. L., & Son, Inc.

Industrial

American District Telegraph Co.
American Fire Alarm Co., Inc.
Autocall Co.
Darley, W. S., & Co.
Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.

Industrial (Continued)
Fire Lite Alarms, Inc.
Fyr-Fyter Electronic & Alarm Corp.
Gamewell Company
General Electric Co., Communications Products Dept.
Halprin Supply Co.
Kidde Ultrasonic & Detection Alarms, Div. Walter Kidde & Co., Inc.
Minneapolis-Honeywell Regulator Co.
Notifier Corp.
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Scott Aviation Corp.
Snyder, M. L., & Son, Inc.

Institutional
American District Telegraph Co.
American Fire Alarm Co., Inc.
Autocall Co.
Darley, W. S., & Co.
Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.
Fire Lite Alarms, Inc.
Fyr-Fyter Electronic & Alarm Corp.
Gamewell Company
General Electric Co., Communications Products Dept.
Halprin Supply Co.
Kidde Ultrasonic & Detection Alarms, Div. Walter Kidde & Co., Inc.
Minneapolis-Honeywell Regulator Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Municipal
American Telephone & Telegraph Co.
Darley, W. S., & Co.
Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.
Fyr-Fyter Electronic & Alarm Corp.
Gamewell Company
General Electric Co., Communications Products Dept.
Notifier Corp.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Scientific Electro Mechanical Industries Corp.
Scott Aviation Corp.

Radio
American Fire Alarm Co., Inc.
Antrex Corp.
Electronics Div., Hobby Enterprises, Inc.
General Electric Co., Communications Products Dept.
Harron Labs
Hobby Enterprises, Inc.
Plectron Corp.
Radio Corp. of America

Recording Systems
American Fire Alarm Co., Inc.
Antrex Corp.
Fyr-Fyter Electronic & Alarm Corp.
Gamewell Company
Notifier Corp.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Scientific Electro Mechanical Industries Corp.

Reels, Cable (Portable)
American Fire Alarm Co., Inc.
Mine Safety Appliances Company

Register Tapes
Boston Clip & Tag Co.

Sirens, Air Horns, Whistles & Coders
American Fire Alarm Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Antrex Corp.
Autocall Co.
Camcone Products, Inc.
Darley, W. S., & Co.
Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.
Fire Lite Alarms, Inc.
Fyr-Fyter Co., The
Fyr-Fyter Electronic & Alarm Corp.
Gamewell Company
Grover Products Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Minneapolis-Honeywell Regulator Co.
Notifier Corp.
Morysville Body Works, Inc.
Russell Fire Equipment, Div. Russell Uniform Co.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Sterling Siren Fire Alarm Co., Inc.
Western Fire Equipment Co.

Smoke
American District Telegraph Co.
Gamewell Company
Halprin Supply Co.
Kidde, Walter, & Co., Inc.
Minneapolis-Honeywell Regulator Co.
Notifier Corp.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Street Box Lights
Plectron Corp.

Tape Systems
Antrex Corp.
Boston Clip & Tag Co.
Fyr-Fyter Electronic & Alarm Corp.
Gamewell Company
Notifier Corp.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Scientific Electro Mechanical Industries Corp.

Watch Tour Systems
American District Telegraph Co.
Autocall Co.
Gamewell Company

LOUD SPEAKERS

Electronic Megaphones
American LaFrance, Div. Sterling Precision Corp.
Antrex Corp.
Audio Equipment Co., Inc.
Darley, W. S., & Co.
Falcon Alarm Co., Inc.
Fi-Tronics Engineering Inc.
Fyrepel Products, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Morysville Body Works, Inc.
Russell Fire Equipment, Div. Russell Uniform Co.
Scott Aviation Corp.
Seiscor Div., Seismograph Service Corp.
Western Fire Equipment Co.
Wheeler Protective Apparel, Inc.
Young Fire Equipment Corp.

Public Address and Intercom Systems
American LaFrance, Div. Sterling Precision Corp.
Antrex Corp.
Audio Equipment Co., Inc. (Portable)
Dominator Corp.
Du Mont, Allen B., Laboratories, Inc.
Federal Sign & Signal Corp.
Fi-Tronics Engineering Inc.
Fyrepel Products, Inc.
Fyr-Fyter Co., The
Fyr-Fyter Electronic & Alarm Corp.
Howe Fire Apparatus Co., Inc.
Morysville Body Works, Inc.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Seiscor Div., Seismograph Service Corp.

RADIO

Interference Shielding
General Electric Co., Communications Products Dept.

Mobile and Station
Antrex Corp.
Du Mont, Allen B., Laboratories, Inc.
General Electric Co., Communication Products Dept.
Harron Labs
Motorola Communications & Electronics, Inc.
Radio Corp. of America
Seiscor Div., Seismograph Service Corp.

Portable
Antrex Corp.
Du Mont, Allen B., Laboratories, Inc.
General Electric Co., Communication Products Dept.
Motorola Communications & Electronics, Inc.
Radio Corp. of America
Seiscor Div., Seismograph Service Corp.

Receivers
Antrex Corp. (Helmet Receivers)
Darley, W. S., & Co.
Du Mont, Allen B., Laboratories, Inc.
Electronics Div., Hobby Enterprises, Inc.
General Electric Co., Communication Products Dept.
Harron Labs
Motorola Communications & Electronics, Inc.
Plectron Corp.
Radio Corp. of America

TELEPHONE-EMERGENCY
American Telephone & Telegraph Co.
Antrex Corp.
Fyr-Fyter Electronic & Alarm Corp.
Gamewell Company
Notifier Corp.

TRAFFIC CONTROL EQUIPMENT
Antrex Corp.
Darley, W. S., & Co.
"El Tec" Electronic Protection Inc.
Rad-O-Lite, Inc.
Scientific Electro Mechanical Industries Corp.
Seiscor Div., Seismograph Service Corp.
Signal Electronics Co.
Trippe Mfg. Co.
Whelen Engineering Co., Inc.

VISUAL DISPLAY DISPATCHING SYSTEMS
Scientific Electro Mechanical Industries Corp.

EXTINGUISHERS

EXTINGUISHERS

ABC Rating
American LaFrance, Div. Sterling Precision Corp.

Carbon Dioxide
American LaFrance, Div. Sterling Precision Corp.
Ansul Chemical Company
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Kidde, Walter, & Co., Inc.
Morysville Body Works, Inc.
Pacific Marine Supply Co.
Pyrene C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

Chimney Fire
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Western Fire Equipment Co.

Dry Chemical
American LaFrance, Div. Sterling Precision Corp.
Ansul Chemical Company
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Ford Div., Fleet Sales Dept.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Kidde, Walter, & Co., Inc.
Morysville Body Works, Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

Foam
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Kidde, Walter, & Co., Inc.
National Foam System, Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

Metal, Fire
American LaFrance, Div. Sterling Precision Corp.
Ansul Chemical Company
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Howe Fire Apparatus Co., Inc.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

Pressurized Water
American LaFrance, Div. Sterling Precision Corp.
Ansul Chemical Company
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Kidde, Walter, & Co., Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

Soda & Acid
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Darley, W. S., & Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Kidde, Walter, & Co., Inc.
Morysville Body Works, Inc.
National Foam System, Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

Vaporizing Liquid
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Ford Div., Fleet Sales Dept.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Kidde, Walter, & Co., Inc.
National Foam System, Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

Water
American LaFrance, Div. Sterling Precision Corp.
Ansul Chemical Company
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Kidde, Walter, & Co., Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Smith, D. B., & Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

EXTINGUISHING SYSTEMS

Automatic Sprinkler Supervision
American District Telegraph Co.
Fyr-Fyter Co., The
Grinnell Co.
Minneapolis-Honeywell Regulator Co.
Pacific Marine Supply Co.
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.

Carbon Dioxide
American LaFrance, Div. Sterling Precision Corp.
Fyr-Fyter Co., The
Grinnell Co.
Halprin Supply Co.
Kidde, Walter, & Co., Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.

Dry Chemical
American LaFrance, Div. Sterling Precision Corp.
Ansul Chemical Company
Fyr-Fyter Co., The
Grinnell Co.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.

Foam
American LaFrance, Div. Sterling Precision Corp.
Fyr-Fyter Co., The
Grinnell Co.
Halprin Supply Co.
National Foam System, Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Co.
Snyder, M. L., & Son, Inc.

Foam Towers
American LaFrance, Div. Sterling Precision Corp.
Fyr-Fyter Co., The
National Foam System, Inc.
Rockwood Sprinkler Co.

Water (Sprinkler)
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Grinnell Co.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Co.

Other
American District Telegraph Co.
Ansul Chemical Company
Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.

EXTINGUISHING AGENTS

Foam-Chemical-Liquid
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
National Foam System, Inc.
Pacific Marine Supply Co.
Peters, A. K., Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

Metal, Fire
American LaFrance, Div. Sterling Precision Corp.
Ansul Chemical Company
Bean, John, Div., Food Machinery & Chemical Corp.
Fyr-Fyter Co., The
Western Fire Equipment Co.

Wetting Agents
Akron Brass Mfg. Co., Inc. (Unox)
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
National Foam System, Inc.
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Stevens, S. G. Co.
Western Fire Equipment Co.

FIRE DEPARTMENT APPLIANCES & SUPPLIES

BADGES, INSIGNIA, ETC.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Blackinton, V. H., & Co., Inc.
Braxmar, C. G., Co., Inc., The
Bullard, E. D., Co.
Cairns & Bro., Inc.
Central Fire Truck Corp.
Darley, W. S., & Co.
Everson-Ross Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Reese, S. H.
Russell Fire Equipment, Div. Russell Uniform Co.
Wentworth-Forman Co., Inc.
Western Fire Equipment Co.

BLANKETS, FIRE
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Bullard, E. D., Co.
Darley, W. S., & Co.
Fulton Cotton Mills
Fyrepel Products, Inc. (Aluminized, Insulated)
Fyr-Fyter Co., The
Halperin, A. E., Co., Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Company
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Wheeler Protective Apparel, Inc.

BROOMS, FIRE FIGHTING
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.
Worcester Brush & Scraper Co.

BROOMS, SAFETY, NON SPARKING
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Howe Fire Apparatus Co., Inc.
Russell Fire Equipment, Div. Russell Uniform Co.

EJECTORS AND EXHAUSTERS, SMOKE
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mountain States Equipment Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Super Vacuum Mfg Co., Inc.
Western Fire Equipment Co.

FIRE ESCAPES

Permanent
American LaFrance, Div. Sterling Precision Corp.
Potter Fire Escape Co.

Portable
American LaFrance, Div. Sterling Precision Corp.
Darley, W. S., & Co.

FOAM CONTAINERS
Arpin, L. G., Co.

FOAM GENERATORS OR PUMPS
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Hale Fire Pump Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
National Foam System, Inc.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Universal Fire Apparatus Corp.

FOAM, TRAILER
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Darley, W. S., & Co.
H. & H. Truck Tank Co., Inc.
National Foam System, Inc.
Rockwood Sprinkler Co.
Universal Fire Apparatus Corp.

FUND RAISING DEVICES
Coin Savers
Handford-Brown Co., Inc.
Holiday Co.

GAS DETECTORS
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Company

GAGES

Brake Line, Pressure
Fyr-Fyter Co., The
Howe Fire Apparatus Co., Inc.

Compound
American LaFrance, Div. Sterling Precision Corp.
Darley, W. S., & Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Universal Fire Apparatus Corp.
Western Fire Equipment Co.

Computers, Pressure
A & W Specialty Co.
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.

Piezometers
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Universal Fire Apparatus Corp.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Pressure
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Darley, W. S., & Co.
Halprin Supply Co.
Universal Fire Apparatus Corp.
Western Fire Equipment Co.

Testing
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Universal Fire Apparatus Corp.

GENERAL FIRE DEPT. SUPPLIES
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Cairns & Bro., Inc.
Central Fire Truck Corp.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halperin, A. E., Co., Inc.
Halprin Supply Co.
Scott Aviation Corp.
Snyder, M. L., & Son, Inc.
Universal Fire Apparatus Corp.
Western Fire Equipment Co.
Young Fire Equipment Corp.

HEAT SHIELD
American LaFrance, Div. Sterling Precision Corp.
Fyrepel Products, Inc.
Mine Safety Appliances Company
National Foam System, Inc.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

LADDERS

Fiberglass
Aluminum Ladder Co.
Bean, John, Div., Food Machinery & Chemical Corp.
Fyr-Fyter Co., The
Himco
Howe Fire Apparatus Co., Inc.

Metal
Aluminum Ladder Co. (Aluminum)
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Duo-Safety Ladder Corp. (Aluminum)
Fyr-Fyter Co., The
Grove Mfg. Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Pirsch, Peter, & Sons Co. (Aluminum)
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

Rope
Atlas Safety Equipment Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Rose Mfg. Co.

Wood
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Duo-Safety Ladder Corp.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Western Fire Equipment Co.

LADDER CLEANER, CHEMICAL
Wellco Chemical Co.

LIFE BELTS
American LaFrance, Div. Sterling Precision Corp.
Atlas Safety Equipment Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Cairns, & Bro., Inc.
Darley, W. S., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Company
Rose Mfg. Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

LIFE GUNS
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Pacific Marine Supply Co
Western Fire Equipment Co.

NETS, LIFE AND TRAINING
American LaFrance, Div. Sterling Precision Corp.
Atlas Safety Equipment Company, Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Rose Mfg. Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

PHOTOGRAPHIC EQUIPMENT
Darley, W. S., & Co.

PRESENTATION GIFTS
Blackinton, V. H., & Co., Inc.
Cairns, & Bro., Inc.

PROPORTIONERS AND EDUCTORS WET WATER AND FOAM
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Hale Fire Pump Co. (Foam)
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
National Foam System, Inc.
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

RECORD BOOKS, DEPARTMENT
Cairns & Bro., Inc.
Darley, W. S., & Co.

REFLECTIVE SIGNS AND MATERIALS
Darley, W. S., & Co.
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Co.
National Marker Corp.
Pacific Reflex Signs
Rose Mfg. Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

RESCUE ALARM
American Fire Alarm Co., Inc.
Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.
Fyr-Fyter Electronic Alarm Corp.
Scientific Electro Mechanical Industries Corp.

RUST PREVENTATIVES
Dakota Chemical Co.
Darley, W. S., & Co.

SALVAGE COVERS
Alb Rubber Co.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Cairns, & Bro., Inc.
Canton Containers, Inc.
Central Fire Truck Corp.
Darley, W. S., & Co.
Fulton Cotton Mills
Fyrepel Products, Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Company
Russell Fire Equipment, Div. Russell Uniform Co.
Seagrave Corporation
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.
Wheeler Protective Apparel, Inc.

SEARCH AND RESCUE EQUIPMENT
American LaFrance, Div. Sterling Precision Corp.
Fyrepel Products, Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Mine Safety Appliances Co.
Porter, H. K., Inc.
Rockwood Sprinkler Co.
Rose Mfg. Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Scientific Electro Mechanical Industries Corp.
Scott Aviation Corp.
Western Fire Equipment Co.

SLIDING POLES, FIRE STATION
Greenberg's, M., Sons, Inc.
McIntire, F. N., Brass Works, Inc.
Western Fire Equipment Co.

SMOKE & ODOR REMOVERS
Bean, John, Div., Food Machinery & Chemical Corp.
Halprin Supply Co.
Mountain States Equipment Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Super Vacuum Mfg. Co., Inc.

SMOKE BOMBS
Acme Protection Equipment Co.
American LaFrance, Div. Sterling Precision Corp.
Darley, W. S., & Co.
Halprin Supply Co.
Superior Signal Co., Inc.
Western Fire Equipment Co.

TEXTBOOKS
Darley, W. S., & Co.

THAWING EQUIPMENT, HYDRANT
American LaFrance, Div. Sterling Precision Corp.
Darley, W. S., & Co.

THREAD CUTTING EQUIPMENT
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Halprin Supply Corp.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

TRAINING AIDS
A & W Specialty Co.
American Film Producers
Delehanty Correspondence School
Investigations Institute
Scientific Electro Mechanical Industries Corp.
Superior Signal Co., Inc.

TRAINING TOWERS
Atlas Safety Equipment Co., Inc.

TROPHIES & PLAQUES
Blackinton, V. H., & Co., Inc.
Greenberg's, M., Sons, Inc.
International Bronze Tablet Co., Inc.

VENTILATING EQUIPMENT
Darley, W. S., & Co.
Halprin Supply Co.
Mine Safety Appliances Company
Mountain States Equipment Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Super Vacuum Mfg. Co., Inc.

WATER TANKS, PORTABLE CANVAS
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Fol-Da-Tank Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Pacific Marine Supply Co
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

FIRE PREVENTION

CHIMNEY BRUSHES
Darley, W. S., & Co.
Worcester Brush & Scraper Co.

FIRE RETARDANT MATERIALS

Paint, etc.

Gamewell Company
Goodrich, B. F., Footwear & Flooring Co.

PANIC EXIT DEVICES

American Fire Alarm Co., Inc.

SAFETY EQUIPMENT FOR FLAMMABLE LIQUIDS

American LaFrance, Div. Sterling Precision Corp.
Fyrepel Products, Inc.
Halprin Supply Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

FIRST AID EQUIPMENT

AMBULANCE COTS

Darley, W. S., & Co.
Ferno Mfg. Co.
Halperin, A. E., Co., Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Company
Russell Fire Equipment, Div. Russell Uniform Co.
Scientific Electro Mechanical Industries Corp.
Washington Products Co.

BURN TREATMENT

Bullard, E. D., Co.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halperin, A. E., Co., Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Company
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

FIRST AID KITS

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Bullard, E. D., Co.
Central Fire Truck Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halperin, A. E., Co., Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Company
Russell Fire Equipment, Div. Russell Uniform Co.

PROTECTIVE BREATHING & REVIVING APPARATUS

Air Breathing Equipment

Acme Protection Equipment Co.
Air-Shields, Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Fluid Power, Inc.
Fyrepel Products, Inc.
Fyr-Fyter Co., The, Fyr-Fyter Div.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mako Products
Mine Safety Appliances Company
Normal Air (Canada) Ltd.
Pacific Marine Supply Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Scott Aviation Corp.
Stephenson Corporation
Ventri-Breather Products, Inc.
Western Fire Equipment Co.
Wheeler Protective Apparel, Inc.

Air Compressors

American LaFrance, Div. Sterling Precision Corp.
Cornelius Co., The
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Mako Products
Mine Safety Appliances Company
Western Fire Equipment Co.

Aspirators

Air-Shields, Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Emerson, J. H., Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Company
Ohio Chemical & Surgical Equipment Co., Div., Air Reduction Co., Inc.
Russell Fire Equipment, Div. Russell Uniform Co.
Stanton Scientific Equipment Co., Inc.
Stephenson Corporation

Inhalators

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Emerson, J. H., Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Company
Ohio Chemical & Surgical Equipment Co., Div., Air Reduction Co., Inc.
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Scott Aviation Corp.
Stanton Scientific Equipment Co., Inc.
Stephenson Corporation

Masks

Acme Protection Equipment Co.
Air-Shields, Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Bullard, E. D., Co.
Central Fire Truck Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mako Products
Mine Safety Appliances Company
Normal Air (Canada) Ltd.
Ohio Chemical & Surgical Equipment Co., Div., Air Reduction Co., Inc.
Rockwood Sprinkler Div., Gamewell Company
Russell Fire Equipment, Div. Russell Uniform Co.
Scott Aviation Corp.
Snyder, M. L., & Son, Inc.
Stephenson Corporation
Western Fire Equipment Co.

Oxygen Breathing Equipment

Acme Protection Equipment Co.
Air-Shields, Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Company
National Welding Equipment Co.
Normal Air (Canada) Ltd.
Ohio Chemical & Surgical Equipment Co., Div., Air Reduction Co., Inc.
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Scott Aviation Corp.
Stephenson Corporation

Respirators

Acme Protection Equipment Co.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Bullard, E. D., Co.
Darley, W. S., & Co.
Emerson, J. H., Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Company
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Scott Aviation Corp.
Snyder, M. L., & Son, Inc.
Stephenson Corporation
Western Fire Equipment Co.

Resuscitators

Air-Shields, Inc.
American LaFrance, Div. Sterling Precision Corp.
Batrow Laboratories, Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Emerson, J. H., Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Company
Ohio Chemical & Surgical Equipment Co., Div., Air Reduction Co., Inc.
Pacific Marine Supply Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Stanton Scientific Equipment Co., Inc.
Stephenson Corporation

UNDERWATER

Bean, John, Div., Food Machinery & Chemical Corp.
Goodrich, B. F., Footwear & Flooring Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mako Products
Scott Aviation Corp.

SPLINTS

Darley, W. S., & Co.
Halperin, A. E., Co., Inc.
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Company
Orthopedic Frame Co.
Scientific Electro Mechanical Industries Corp.

STRETCHERS

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Bullard, E. D., Co.
Central Fire Truck Corp.
Darley, W. S., & Co.
Fyrepel Products, Inc.
Halperin, A. E., Co., Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mine Safety Appliances Company
Russell Fire Equipment, Div. Russell Uniform Co.
Scientific Electro Mechanical Industries Corp.
Washington Products Co
Western Fire Equipment Co.

HOSE, HOSE FITTINGS & HOSE STREAM APPLIANCES

HOSE, CHEMICAL & BOOSTER

American Biltrite Rubber Co., Boston Woven Hose & Rubber Div.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Bi-Lateral Fire Hose Co.
Central Fire Truck Corp.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Fabric Fire Hose Co.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Industrial Products Co., Div. B. F. Goodrich Co.
Halprin Supply Co.
Hewitt-Robins, Inc.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Porter, H. K., Co., Inc., Thermoid Div.
Republic Rubber Division, Lee Rubber & Tire Corp.
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
United States Rubber Co.
Western Fire Equipment Co.

HOSE, COTTON AND SYNTHETIC FIBER, R. L.

American Biltrite Rubber Co., Boston Woven Hose & Rubber Div.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Bi-Lateral Fire Hose Co.
Central Fire Truck Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Eureka Fire Hose Div., U. S. Rubber Co.
Fabric Fire Hose Co.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Industrial Products Co., Div. B. F. Goodrich Co.
Halprin Supply Co.
Hewitt-Robins, Inc.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Porter, H. K., Co., Inc., Thermoid Div.
Republic Rubber Division, Lee Rubber & Tire Corp.
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
United States Rubber Co.
Western Fire Equipment Co.

HOSE, FORESTRY

American Biltrite Rubber Co., Boston Woven Hose & Rubber Div.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Bi-Lateral Fire Hose Co.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Fabric Fire Hose Co.

Hose, Forestry (Continued)
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Industrial Products Co., Div. B. F. Goodrich Co.
Halprin Supply Co.
Hewitt-Robins, Inc.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Porter, H. K., Co., Inc., Thermoid Div.
Republic Rubber Division, Lee Rubber & Tire Corp.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

HOSE, HIGH PRESSURE
American Biltrite Rubber Co., Boston Woven Hose & Rubber Div.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Bi-Lateral Fire Hose Co.
Central Fire Truck Corp.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Fabric Fire Hose Co.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Industrial Products Co., Div. B. F. Goodrich Co.
Halprin Supply Co.
Hewitt-Robins, Inc.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Porter, H. K., Co., Inc., Thermoid Div.
Republic Rubber Division, Lee Rubber & Tire Corp.
Russell Fire Equipment, Div. Russell Uniform Co.
United States Rubber Co.
Western Fire Equipment Co.

HOSE, LINEN
American LaFrance, Div. Sterling Precision Corp.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Goodall Rubber Co.
Howe Fire Apparatus Co., Inc.
Pacific Marine Supply Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

HOSE, 100% SYNTHETIC FIBER
Hewitt-Robins Inc.

HOSE, SUCTION
American Biltrite Rubber Co., Boston Woven Hose & Rubber Div.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Bi-Lateral Fire Hose Co.
Central Fire Truck Corp.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Fabric Fire Hose Co.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Industrial Products Co., Div. B. F. Goodrich Co.
Halprin Supply Co.
Hewitt-Robins Inc.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Porter, H. K., Co., Inc., Thermoid Div.
Republic Rubber Division, Lee Rubber & Tire Corp.
Russell Fire Equipment, Div. Russell Uniform Co.
United States Rubber Co.
Western Fire Equipment Co.

HOSE APPLIANCES

Carriers
Atlas Safety Equipment Co., Inc.

Holders
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Powhatan Brass & Iron Works
Seagrave Corporation
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Hydrant Gates
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc
Mueller Co.
Powhatan Brass & Iron Works
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Increasers and Reducers
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Camcone Products, Inc.
Central Fire Truck Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Excelsior Brass Mfg. Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Siamese and Y-fittings
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Camcone Products, Inc.
Central Fire Truck Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Grinnell Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Siphons
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

Suction Strainers
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fol-Da-Tank Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.
Seagrave Corporation
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Swivel Joints
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Camcone Products, Inc.
Central Fire Truck Corp.
Darley, W. S., & Co.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

HOSE BRIDGES
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Consolidated Welding & Engineering, Inc.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

HOSE CABINET UNITS
American LaFrance, Div. Sterling Precision Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Goodall Rubber Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Pacific Marine Supply Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

HOSE CARTS, RACKS
American LaFrance, Div. Sterling Precision Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
H. & H. Truck Tank Co., Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

HOSE CLAMPS
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bar-Way Mfg. Co.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Goodall Rubber Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Republic Rubber Division, Lee Rubber & Tire Corp.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

HOSE CLEANER
American LaFrance, Div. Sterling Precision Corp.
Bi-Lateral Fire Hose Co.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.

HOSE COUPLING EXPANDERS
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Republic Rubber Division, Lee Rubber & Tire Corp.
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

HOSE COUPLING EXPANSION RINGS
Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Eureka Fire Hose Div., U. S. Rubber Co.
Excelsior Brass Mfg. Co.
Fabric Fire Hose Co.
Fyr-Fyter Co., The
Goodall Rubber Co.

Goodrich, B. F., Industrial Products Co., Div.
B. F. Goodrich Co.
Greenberg's, M., Sons
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Republic Rubber Division, Lee Rubber & Tire Corp.
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

HOSE COUPLINGS, ADAPTERS, WRENCHES

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bar-Way Mfg. Co. (Couplings, High Pressure)
Bean, John, Div., Food Machinery & Chemical Corp.
Camcone Products, Inc.
Central Fire Truck Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fabric Fire Hose Co.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Industrial Products Co., Div.
B. F. Goodrich Co.
Greenberg's, M., Sons, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Republic Rubber Division, Lee Rubber & Tire Corp.
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

HOSE CUTTERS

Central Fire Truck Corp.
Fyr-Fyter Co., The
Howe Fire Apparatus Co., Inc.

HOSE DRYERS

American LaFrance, Div. Sterling Precision Corp.
Circul-Air Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

HOSE FIBRE, POLYESTER

American Biltrite Rubber Co., Boston Woven Hose & Rubber Div.
American LaFrance, Div. Sterling Precision Corp.
Darley, W. S., & Co.
Du Pont de Nemours, E. I. & Co., Inc.
Fabric Fire Hose Co.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Industrial Products Co., Div.
B. F. Goodrich Co.
Howe Fire Apparatus Co., Inc.
Porter, H. K., Co., Inc., Thermoid Div.

HOSE JACKETS

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Eureka Fire Hose Div., U. S. Rubber Co.
Fyr-Fyter Co., The
Goodrich, B. F., Industrial Products Co., Div.
B. F. Goodrich Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Porter, H. K., Co., Inc., Thermoid Div.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Republic Rubber Division, Lee Rubber & Tire Corp.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

HOSE REELS

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Goodall Rubber Co.
H. & H. Truck Tank Co., Inc.
Halprin Supply Co.
Hannay, Clifford B., & Son. Inc.
Howe Fire Apparatus Co., Inc.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

HOSE STORAGE RACKS

American LaFrance, Div. Sterling Precision Corp.
Circul-Air Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Goodall Rubber Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Russell Fire Equipment, Div. Russell Uniform Co.
W-B Manufacturing Co.
Western Fire Equipment Co.

HOSE TURN TABLES

American LaFrance, Div. Sterling Precision Corp.
Circul-Air Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

HOSE WASHERS

American LaFrance, Div. Sterling Precision Corp.
Circul-Air Corp.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Goodrich, B. F., Industrial Products Co., Div.
B. F. Goodrich Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Powhatan Brass & Iron Works
Republic Rubber Division, Lee Rubber & Tire Corp.
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.

HYDRANT WRENCHES

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mueller Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Waterous Company
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

HYDRANTS

Akron Brass Mfg. Co., Inc.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mueller Co.
Waterous Company

NOZZLES

Cellar Pipe

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Deck Guns

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Cromer Mfg. & Eng., Inc.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Rockwood Sprinkler Co.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Deluge Sets

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Cromer Mfg. & Eng., Inc.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Rockwood Sprinkler Co.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Distributor

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Foam

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
National Foam System, Inc.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Santa Rosa Fire Nozzle, Inc.
Western Fire Equipment Co.

Fog

Akron Brass Mfg. Co., Inc.
American Fire Apparatus Co.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Camcone Products, Inc.
Central Fire Truck Corp.
Cromer Mfg. & Eng., Inc.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Goodall Rubber Co.
Halprin Supply Co.
Hardie Mfg. Co., Inc.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Co., Div. Gamewell Company
Russell Fire Equipment, Div. Russell Uniform Co.
Santa Rosa Fire Nozzle, Inc.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Fog Foam

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Cromer Mfg. & Eng., Inc.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
National Foam System, Inc.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Co., Div. Gamewell Company
Russell Fire Equipment, Div. Russell Uniform Co.
Santa Rosa Fire Nozzle, Inc.
Western Fire Equipment Co.

Fog, High Pressure

Akron Brass Mfg. Co., Inc.
American Fire Apparatus Co.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp. (gun type)
Central Fire Truck Corp.
Cromer Mfg. & Eng., Inc.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The

Fog, High Pressure (Continued)

Goodall Rubber Co.
Halprin Supply Co.
Hardie Mfg. Co., Inc.
Howe Fire Apparatus Co., Inc.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

Master Stream

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Camcone Products, Inc.
Central Fire Truck Corp.
Cromer Mfg. & Eng., Inc.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Partition

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Pipes, Ladder

Akron Brass Mfg. Co., Inc. (also automatic)
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Central Fire Truck Corp.
Cromer Mfg. & Eng., Inc.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc. (also automatic)
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Russell Fire Equipment, Div. Russell Uniform Co.
Seagrave Corporation
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Pipes, Play

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Camcone Products, Inc.
Central Fire Truck Corp.
Cromer Mfg. & Eng., Inc.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Industrial Products Co.
B. F. Goodrich Co.
Greenberg's, M., Sons, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Republic Rubber Division, Lee Rubber & Tire Corp.
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Seagrave Corporation
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Shut-Off

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Camcone Products, Inc.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Turrets

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Cromer Mfg. & Eng., Inc.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
National Foam System, Inc.
Rockwood Sprinkler Co.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

VALVES

Discharge and Suction

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Camcone Products, Inc.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Hale Fire Pump Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Russell Fire Equipment, Div. Russell Uniform Co.
Waterous Company
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Hose

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Camcone Products, Inc.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Hale Fire Pump Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mueller Co.
Powhatan Brass & Iron Works
Rockwood Sprinkler Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Hydrant-Gates

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
McIntire, F. N., Brass Works, Inc.
Mueller Co.
Powhatan Brass & Iron Works
Russell Fire Equipment, Div. Russell Uniform Co.
Waterous Company
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

Post Indicator

Bean, John, Div. Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons, Inc.
Grinnell Co.
Howe Fire Apparatus Co., Inc.
Mueller Co.
Rockwood Sprinkler Co.

Relief

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Hale Fire Pump Co.
High Fog Pump Co.
Howe Fire Apparatus Co., Inc.
Mueller Co.
Western Fire Equipment Co.

LIGHTING AND LIGHTING EQUIPMENT

BATTERIES, FLASHLIGHT

Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Burgess Battery Co., Div. Servel, Inc.
Carpenter Manufacturing Co.
Darley, W. S., & Co.
Howe Fire Apparatus Co., Inc.
Halprin Supply Co.
Mine Safety Appliances Co.
Pacific Marine Supply Co.
Western Fire Equipment Co.

BATTERY CHARGERS

Antrex Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Carpenter Manufacturing Co.
Darley, W. S., & Co.
Fyr-Fyter Electronic & Alarm Corp.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Pacific Marine Supply Co.
Pioneer Gen-E-Motor Corp.
Rockwood Sprinkler Div.
Russell Fire Equipment, Div. Russell Uniform Co.
Schauer Mfg. Corp.
Sun Electric Corp.

EMERGENCY GENERATORS

Portable

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Central Fire Truck Corp.
Darley, W. S., & Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Kohler Co.
Milwaukee Electric Tool Corp.
Onan, Div., Studebaker-Packard Corp.
Pacific Marine Supply Co.
Pioneer Gen-E-Motor Corp.
Russell Fire Equipment, Div. Russell Uniform Co.
Waukesha Motor Company
Western Fire Equipment Co.
Wincharger Corp., subs., Zenith Radio Corp.

Stationary

American LaFrance, Div. Sterling Precision Corp.
Brumbaugh Body Co., Inc.
Darley, W. S., & Co.
Howe Fire Apparatus Co., Inc.
Kohler Co.
Onan, Div., Studebaker-Packard Corp.
Pioneer Gen-E-Motor Corp.
Russell Fire Equipment, Div. Russell Uniform Co.
Waukesha Motor Company
Wincharger Corp., subs., Zenith Radio Corp.

LIGHTS

Emergency (Automatic)

American LaFrance, Div. Sterling Precision Corp.
Brumbaugh Body Co., Inc.
Burgess Battery Co., Div. Servel, Inc.
Carpenter Manufacturing Co.
Darley, W. S., & Co.
Dietz, R. E., Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Macchi & Company
Rockwood Sprinkler Div.
Russell Fire Equipment, Div. Russell Uniform Co.
Sireno Signal Mfg. Corp.
Trippe Mfg. Co.
U-C Lite Manufacturing Co.
Western Fire Equipment Co.
Whelen Engineering Co., Inc.

Flares

American LaFrance, Div. Sterling Precision Corp.
Brumbaugh Body Co., Inc.
Carpenter Manufacturing Co.
Darley, W. S., & Co.
Federal Sign & Signal Corp.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
U-C Lite Manufacturing Co.
Western Fire Equipment Co.

Floodlights

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Carpenter Manufacturing Co.
Darley, W. S., & Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mako Products
Natale Machine & Tool Co.
Pacific Marine Supply Co.
Rockwood Sprinkler Div.
Russell Fire Equipment, Div. Russell Uniform Co.
Sireno Signal Mfg. Corp.
Stonco Electric Products Co.
Western Fire Equipment Co.
Wincharger Corp., subs., Zenith Radio Corp.

Hand Lamps

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Burgess Battery Co., Div. Servel, Inc.
Carpenter Manufacturing Co.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Natale Machine & Tool Co.
Rockwood Sprinkler Div.
Russell Fire Equipment, Div. Russell Uniform Co.
Sireno Signal Mfg. Corp.
Stonco Electric Products Co.
U-C Lite Manufacturing Co.
Western Fire Equipment Co.

Helmet and Belt

Rockwood Sprinkler Div.

Reels, Cable—Power Supply (Portable)

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Hannay, Clifford B., & Son, Inc.
Howe Fire Apparatus Co., Inc.
Natale Machine & Tool Co.
Stonco Electric Products Co.
Western Fire Equipment Co.

Searchlights

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Carpenter Manufacturing Co.
Darley, W. S., & Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Natale Machine & Tool Co.
Pacific Marine Supply Co.
Rockwood Sprinkler Div.
Russell Fire Equipment, Div. Russell Uniforms
Sireno Signal Mfg. Corp.
Western Fire Equipment Co.

PUMPS

PUMPS

Fire Apparatus

American Fire Pump Co.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Central Fire Truck Corp.
Crown Coach Corp., Firecoach Div.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Hale Fire Pump Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Marlow Pumps, Div. Bell & Gossett Co.
Oberdorfer Foundries, Inc., Pump Div.
Russell Fire Equipment, Div. Russell Uniform Co.
Seagrave Corporation
Universal Fire Apparatus Corp.
Waterous Company
Western Fire Equipment Co.

Hand Pumps

Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Pacific Marine Supply Co.
Russell Fire Equipment, Div. Russell Uniforms
Smith, D. B., & Co., Inc.
Universal Fire Apparatus Corp.
Western Fire Equipment Co.

High Pressure

American Fire Pump Co.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Crown Coach Corp., Firecoach Div.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Gorman-Rupp Co.
Hale Fire Pump Co.
Halprin Supply Co.
Hardie Mfg. Co., Inc.
High Fog Pump Co.
Howe Fire Apparatus Co., Inc.
Marine Products Company
Marlow Pumps, Div. Bell & Gossett Co.
Pacific Marine Supply Co.
Seagrave Corporation
Waterous Company
Western Fire Equipment Co.

Hydrant Dewatering

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Darley, W. S., & Co.
Gorman-Rupp Co.
Hale Fire Pump Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Kenco Pump Division
Marine Products Company
Marlow Pumps, Div. Bell & Gossett Co.
Western Fire Equipment Co.

Portable

American Fire Pump Co.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Crown Coach Corp., Firecoach Div.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Gorman-Rupp Co.
Hale Fire Pump Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Kenco Pump Division
Marine Products Company
Marlow Pumps, Div. Bell & Gossett Co.
Oberdorfer Foundries, Inc., Pump Div.
Pacific Marine Supply Co.
Rice Pump & Machine Co.
Russell Fire Equipment, Div. Russell Uniforms
Smith, D. B., & Co., Inc.
Universal Fire Apparatus Corp.
Western Fire Equipment Co.

Suction Boosters

Brumbaugh Body Co., Inc.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Gorman-Rupp Co.
Hale Fire Pump Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Leonard Pump Div., Electro Switch Corp.
Marine Products Co.
Marlow Pumps, Div. Bell & Gossett Co.
Oberdorfer Foundries, Inc., Pump Div.
Universal Fire Apparatus Corp.
Western Fire Equipment Co.

Trailer Mounted

American Fire Pump Co.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Darley, W. S., & Co.
Gorman-Rupp Co.
Hale Fire Pump Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Marine Products Co.
Marlow Pumps, Div. Bell & Gossett Co.
Maxim Motor Co.
Universal Fire Apparatus Corp.
Waterous Company
Western Fire Equipment Co.

TOOLS

AXES

American LaFrance, Div. Sterling Precision Corp.
Atlas Safety Equipment Co., Inc. (Insulated)
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Central Fire Truck Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mann Edge Tool Company
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Universal Fire Apparatus Corp.
Western Fire Equipment Co.

CUTTERS, BAR, CHAIN, WIRE

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Central Fire Truck Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Milwaukee Electric Tool Corp.
Porter, H. K., Inc.
Russell Fire Equipment, Div. Russell Uniform Co.
Universal Fire Apparatus Corp.
Western Fire Equipment Co.

CUTTING & WELDING EQUIPMENT

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Milwaukee Electric Tool Corp.
National Welding Equipment Co.
Russell Fire Equipment, Div. Russell Uniform Co.

FORCIBLE ENTRY TOOLS

Akron Brass Mfg. Co., Inc.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Boston Clip & Tag Co.
Brumbaugh Body Co., Inc.
Central Fire Truck Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Mann Edge Tool Company
Milwaukee Electric Tool Corp.
Pirsch, Peter, & Sons, Co.
Porter, H. K., Inc.
Potter Fire Escape Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Universal Fire Apparatus Corp.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

HOOK & PIKE POLES

Akron Brass Mfg. Co., Inc.
Aluminum Ladder Co.
American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
C. D. Pike & Fire Hook Mfg. Corp.
Central Fire Truck Corp.
Darley, W. S., & Co.
Duo-Safety Ladder Corp.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Pacific Marine Supply Co.
Russell Fire Equipment, Div. Russell Uniform Co.
Snyder, M. L., & Son, Inc.
Universal Fire Apparatus Corp.
Western Fire Equipment Co.
Wooster Brass Products, Fyr-Fyter Co., The

HOT LINE HANDLING TOOLS

Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Western Fire Equipment Co.

JACKS (Hydraulic)

Bean, John, Div., Food Machinery & Chemical Corp.
Brumbaugh Body Co., Inc.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Porter, H. K., Inc.
Russell Fire Equipment, Div. Russell Uniforms
Western Fire Equipment Co.

POWER TOOLS

Bean, John, Div., Food Machinery & Chemical Corp.
Boston Clip & Tag Co.
Darley, W. S., & Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Milwaukee Electric Tool Corp.
Mine Safety Appliances Co.
Pacific Marine Supply Co.
Porter, H. K., Inc.
Western Fire Equipment Co.

RESCUE TOOLS, HYDRAULIC

American LaFrance, Div. Sterling Precision Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Griphoist, Inc., (hoist & pulling units)
Grove Mfg. Co.
Halprin Supply Co.
Howe Fire Apparatus Co., Inc.
Milwaukee Electric Tool Corp.
Mine Safety Appliances Company
Porter, H. K., Inc.
Russell Fire Equipment, Div. Russell Uniform Co.
Western Fire Equipment Co.

SAWS, CHAIN

Darley, W. S., & Co.
Halprin Supply Co.
Milwaukee Electric Tool Corp., (Electric)
Western Fire Equipment Co.

TOOLS, GENERAL PURPOSE

Boston Clip & Tag Co.
Central Fire Truck Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Milwaukee Electric Tool Corp.
Porter, H. K., Inc.
Universal Fire Apparatus Corp.
Western Fire Equipment Co.

DIRECTORY OF MANUFACTURERS

Listed in WHERE TO BUY SECTION

For Advertisers in this issue see Advertising Index on page 884

A

A & W Specialty Co., 3717 Midland Ave., Syracuse 7, N. Y.
Acme Protection Equipment Co., 1215 Kalamazoo St., South Haven, Mich.
Air-Shields, Inc., Hatboro, Pa.
Akron Brass Mfg. Co., Inc., Ft. of Spruce St., Wooster, Ohio
Alb Rubber Co., 366 Somerville Ave., Somerville 43, Mass.
Aluminum Ladder Co., 25 West Darlington St. Ext., Florence, S. C.
American Biltrite Rubber Co., Inc., Boston Woven Hose & Rubber Div., P. O. Box 1071, Boston 3, Mass.
American District Telegraph Co., 155 Sixth Ave., New York 13, N. Y.
American Film Producers, 1600 Broadway, New York 19, N. Y.
American Fire Alarm Co., Inc., 909 N. E. Davis St., Portland 12, Ore.
American Fire Apparatus Co., Box 1024, Battle Creek, Mich.
American Fire Pump Co., P. O. Box 219, 803 Main St. Rd., Battle Creek, Mich.
American LaFrance, Div. Sterling Precision Corp., 100 E. LaFrance St., Elmira, N. Y.
American Telephone & Telegraph Co., Emergency Rep. & Group Alerting System, 195 Broadway, New York 7, N. Y.
Ansul Chemical Co., 1 Stanton St., Marinette, Wis.
Antrex Corp., 2001 W. Willow, Chicago 47, Ill.
Arpin, L. G., Co., Box 284, Caldwell, N. J.
Atlas Safety Equipment Co., Inc., 175 N. 10th St., Brooklyn 11, N. Y.
Audio Equipment Co., Inc., 75 Harbor Road, Port Washington, N. Y.
Autocall Co., 262 Mack Ave., Shelby, Ohio

B

Bancroft Cap Co., 180 Franklin St., Framingham, Mass.
Bar-Way Mfg. Co., 2770 Summer St., Stamford, Conn.
Batrow Laboratories, Inc., Branford, Conn.
Baughman Mfg. Co., 318 Shipman Rd., Jerseyville, Ill.
Beacon Falls Rubber Footwear, Beacon Falls, Conn.
Bean, John, Div., Food Machinery and Chemical Corp., 1305 S. Cedar St., Lansing 9, Mich.
Bi-Lateral Fire Hose Co., 20 N. Wacker Dr., Chicago 6, Ill.
Blackinton, V. H., & Co., Inc., 140 Commonwealth Ave., Attleboro Falls, Mass.
Boardman Co., Fire Apparatus Div., 1401 S. W. 11th St., P. O. Box 1152, Oklahoma City 1, Okla.
Body-Guard Mfg. Co., 222 S. Fourth St., St. Joseph, Mo.
Boston Clip & Tag Co., 48 Grove St., Somerville 44, Mass.
Braxmar, C. G., Inc., The, 216 E. 45th St., New York 17, N. Y.
Brumbaugh Body Co., Inc., 100 W. Plank Rd., Altoona, Pa.
Bullard, E. D., Co., 2680 Bridgeway, Sausalito, Cal.
Burgess Battery Co., Div. Servel, Inc., Freeport, Ill.

C

Cairns & Bro., Inc., 854 Bloomfield Ave., Allwood, Clifton, N. J.
Camcone Products, Inc., 55 De Lucca Place, San Rafael, Cal.
Canton Containers, 1101 Ninth St., S. E., Box 871, Canton 7, Ohio
Carpenter Mfg. Co., 628 Bradley St., Somerville 45, Mass.
C. D. Pike & Fire Hook Mfg. Corp., P. O. Box 1649, New Haven 7, Conn.
Central Fire Truck Corp., P. O. Box 158, Manchester, Mo.
Challenger Corp., The, P. O. Box 2054, 4933 Lamar Ave., Memphis 2, Tenn.
Christopher Co., The, Div. International Auto-Industries Corp., 1095 Madison Ave., New York 28, N. Y.
Circul-Air Corp., 575 E. Milwaukee Ave., Detroit 2, Mich.
Coin Savers, 330 Second St., New Cumberland, Pa.
Consolidated Welding & Engineering, Inc., 34 French St., Methuen, Mass.
Continental Motors Corp., 205 Market St., Muskegon, Mich.
Cornelius Company, The, 550—39th Ave., N. E., Minneapolis 21, Minn.
Cromer Mfg. & Engineering, Inc., 2138 E. 88th St., Los Angeles 2, Cal.
Crown Coach Corp., Firecoach Div., 2500 E. 12th St., Los Angeles 21, Cal.

D

Dakota Chemical Co., 1802 W. 12th St., Sioux Falls, S. D.
Dana Corp., Toledo 1, Ohio
Darley, W. S., & Co., 2810 Washington Blvd., Chicago 12, Ill.
Delehanty Correspondence School, 115 E. 15th St., New York, N. Y.
Detroit Automotive Products, 8701 Grinnell Ave., Detroit 13, Mich.
Dietz, R. E., Co., 225 Wilkinson St., Syracuse, N. Y.
Divco Truck Div., Divco-Wayne Corp., 22000 Hoover Rd., Detroit 5, Mich.
Dominator Corp., Box 7098, Kansas City 13, Mo.
Du Mont, Allen B., Laboratories, Inc., 750 Bloomfield Ave., Clifton, N. J.
Duo-Safety Ladder Corp., 513 W. 9th Ave., Oshkosh, Wis.
Du Pont de Nemours, E. I., & Co., Inc., Textile Fibers Dept., Wilmington 98, Del.

E

Eastman, Samuel, Co., Inc., Foundry St., Concord, N. H.
Edmont Glove Co. (Edmont, Inc.), Coshocton, Ohio
Electronics Div., Hobby Enterprises, Inc., 17 Second Ave., Bay Shore, L. I., N. Y.
Elkhart Brass Mfg. Co., Inc., 1302 W. Beardsley Ave., Elkhart, Ind.
Ellcon-National, Inc., 30 Church St., New York 7, N. Y.
"El-Tec" Electronic Protection, Inc., 97 Northfield Rd., West Orange, N. J.
Electro Switch Corp., Leonard Pump Div., 167 King Ave., Weymouth 88, Mass.
Emerson, J. H., Co., 22 Cottage Park Ave., Cambridge 40, Mass.
Eureka Fire Hose Div., U. S. Rubber Co., P. O. Box 408, Newtown, Conn.
Everson-Ross Co., Inc., 55 Vandam St., New York 13, N. Y.
Excelsior Brass Mfg. Co., 623 Madison St., Evanston, Ill.

F

Fabric Fire Hose Co., Sandy Hook, Conn.
Falcon Alarm Co., Inc., 243 Broad St., Summit, N. J.
Federal Sign & Signal Corp., 8702 S. Western Ave., Blue Island, Ill.
Ferno Mfg. Co., Greenfield, Ohio
Fi-Tronics Engineering, Inc., P. O. Box 43, Wayne, Pa.
Fire Lite Alarms, Inc., 190 Fulton Tr., New Haven, Conn.
Fluid Power, Inc., 663 Aurora Road, Macedonia, Ohio
Fol-Da-Tank Co., Box 361, Rock Island, Ill.
Ford Division, Fleet Sales Dept., P. O. Box 658, Dearborn, Mich.
Fulton Cotton Mills, P. O. Box 1726, Atlanta 1, Ga.
FWD Corp., E. 12th St., Clintonville, Wis.
Fyrepel Products, Inc., P. O. Box 503, Newark, Ohio
Fyr-Fyter Co., The, Fyr-Fyter Div., 221 Crane St., Dayton 1, Ohio
Fyr-Fyter Electronic & Alarm Corp., P. O. Box 66, U. S. Highway #1, Edison, N. J.

G

Gamewell Co., 1238 Chestnut St., Newton Upper Falls 64, Mass.
Garrison Mfg. Co., Inc., 4609 E Sheila St., Los Angeles 22, Cal.
General Electric Co., Communication Products Dept., Mountainview Rd., Lynchburg, Va.
Gerstenslager Co., 1425 E. Bowman St., Wooster, Ohio
Globe Manufacturing Co., Pittsfield, N. H.
GMC Truck & Coach Div., General Motors Corp., 660 S. Boulevard, East, Pontiac 11, Mich.
Gold Crest Safety Equipment Corp., P. O. Box 155, U. S. Highway 22, Dunellen, N. J.
Goodall Rubber Co., Whitehead Rd., Trenton 4, N. J.
Goodrich, B. F., Footwear & Flooring Co., Div. The B. F. Goodrich Co., Watertown 72, Mass.
Goodrich, B. F., Industrial Products Co., Div., B. F. Goodrich Co., 500 S. Main St., Akron 18, Ohio
Gorman-Rupp Co., 305 Bowman St., Mansfield, Ohio
Greenberg's, M., Sons, Inc., 765 Folsom St., San Francisco 7, Cal.
Grinnell Co., 260 W. Exchange St., Providence 1, R. I.
Griphoist, Inc., 744 Harrison St., San Francisco 7, Cal.
Grove Mfg. Co., Shadygrove, Pa.
Grover Products Co., 1233 S. Hope St., Los Angeles 15, Cal.

H

H. & H. Truck Tank Co., Inc., 725 Tonnele Ave., Jersey City 7, N. J.
Hahn Motors, Inc., Hamburg, Pa.
Hale Fire Pump Co., 708 Spring Mill Ave., Conshohocken, Pa.
Halperin, A. E., Co., Inc., 75-87 Northampton St., Boston 18, Mass.
Halprin Supply Co., 1355 S. Flower St., Los Angeles 15, Cal.
Handford-Brown Co., Coytesville-On-The-Hudson, N. J.
Hannay, Clifford B., & Son, Inc., Westerlo, N. Y.
Hardie Mfg. Co., Inc., 730 S. Main St., Wilkes-Barre, Pa.
Harron Labs., 42-10 220th St., Bayside 61, N. Y.
Hercules Motors Corp., 101 Eleventh St., S. E., Canton 2, Ohio
Hess & Eisenhardt Co., 8959 Blue Ash Ave., Cincinnati 42, Ohio
Hewitt-Robins, Inc., 666 Glenbrook Ave., Stamford, Conn.
High Fog Pump Co., 35 Santa Clara, Arcadia, Cal.
Himco, 734 A St., San Rafael, Cal.
Hobby Enterprises, Inc., 17 Second Ave., Bay-Shore, L. I., N. Y.
Holiday Co., 1666 Kinsey St., Philadelphia, Pa.
Hood Industrial Footwear & Glove, Div. The B. F. Goodrich Co., Watertown 72, Mass.
Howe Fire Apparatus Co., Inc., 1402 W. 22nd St., Anderson, Ind.

I

International Bronze Tablet Co., Inc., 150 W. 22nd St., New York 11, N. Y.
International Harvester Co., Motor Truck Div., 180 N. Michigan Ave., Chicago 1, Ill.
Investigations Institute, 53 W. Jackson Blvd., Chicago 4, Ill.

J

Janesville Apparel Co., 104 Laurel Ave., Janesville, Wis.

K

Kenco Pump Div., 1305 Oberlin Ave., Lorain, Ohio
Kidde, Ultrasonic & Detection Alarms, Div. Walter Kidde & Co., Inc., 933A Brighton Rd., Clifton, N. J.
Kidde, Walter, & Co., Inc., 933A Main St., Belleville 9, N. J.
Kohler Co., Kohler, Wis.

L

Leece-Neville Co., 1374 E. 51st St., Cleveland 3, Ohio
Leonard Pump Div., Electro Switch Corp., 167 King Ave., Weymouth 88, Mass.

Mc

McDermott, Julian A., Corp., 1639 Stephen St., Ridgewood 27, L. I., N. Y.
McIntire, F. N., Brass Works, Inc., 377 Putnam Ave., Cambridge 39, Mass.

M

Macchi & Co., 819 Valencia St., San Francisco 10, Cal.
Mack Trucks, Inc., Fire Apparatus Div., 601 S. 10th St., Allentown, Pa.
Mako Products, 2931 N. E. Second Ave., Miami, Fla.
Mann Edge Tool Co., Box 351, Lewistown, Pa.
Marine Products Co., 515 Lycaste Ave., Detroit 14, Mich.
Marlow Pumps, Div. Bell & Gossett Co., P. O. Box 200, Midland Park, N. J.
Maxim Motor Co., 170 Wareham St., Middleboro, Mass.
Midwestern Safety Mfg. Co., Mackinaw, Ill.
Miller-Meteor Div., Divco-Wayne Corp., 1500 "F" St., Richmond, Ind.
Milwaukee Electric Tool Corp., 5368 W. State St., Milwaukee 8, Wis.
Mine Safety Appliances Co., 201 North Braddock Ave., Pittsburgh 8, Pa.
Minneapolis - Honeywell Regulator Co., 2753 Fourth Ave., S., Minneapolis 8, Minn.
Minnesota Mining & Mfg. Co., 900 Bush Ave., St. Paul 6, Minn.
Mobay Chemical Co., Pittsburgh 5, Pa.
Mobile Aerial Towers, Inc., 1730 N. Harrison St., Fort Wayne 7, Ind.
Morning Pride Mfg. Co., 1986 Home Ave., Dayton, Ohio
Morysville Body Works, Inc., 813 S. Reading Ave., Boyertown, Pa.
Motorola Communications & Electronics, Inc., 4501 Augusta Blvd., Chicago 51, Ill.
Mountain States Equipment Co., 1238 Speer Blvd., Denver 4, Colo.
Mueller Co., 512 W. Cerro Gordo St., Decatur, Ill.

N

Natale Machine and Tool Co., Box 95, Carlstadt, N. J.
National Foam System, Inc., Union and Adams Sts., West Chester, Pa.
National Marker Corp., 225 Wampanoag Trail, East Providence 15, R. I.
National Welding Equipment Co., 218 Fremont St., San Francisco 5, Cal.
Normal Air (Canada) Ltd., 1425 The Queensway, Toronto, Ontario, Can.
Norlund, O. A., Co., Div. Mann Edge Tool Co., P. O. Box 351, Lewistown, Pa.
North American Signal Co., 1120 Minor Drive, Wilmette, Ill.
Notifier Corp., 3700 N. 56th St., Lincoln, Nebr.

O

Oberdorfer Foundries, Inc., Pump Div., Thompson Rd., Syracuse 1, N. Y.
Ohio Chemical & Surgical Equipment Co., Div. Air Reduction Co., Inc., 1400 E Washington Ave., Madison 10, Wis.
Onan Div., Studebaker-Packard Corp., 2515 University Ave., S. E., Minneapolin 14, Minn.
Orthopedic Frame Co., 420 Alcott St., Kalamazoo, Mich.

P

Pacific Marine Supply Co., 1223 Western Ave., Seattle 3, Wash.
Pacific Reflex Signs, Box 323, McMinnville, Ore.
Peters, A. K., Co., 230 Park Ave., New York, N. Y.
Pioneer Gen-E-Motor Corp., 5832 W. Dickens Ave., Chicago 39, Ill.
Pirsch, Peter, & Sons Co., 1308 35th St., Kenosha, Wis.
Plectron Corp., P. O. Box 7, Overton, Neb.
Porter, H. K., Inc., 74 Foley St., Somerville 43, Mass.
Porter, H. K., Co., Inc., Thermoid Div., 601 Grant St., Pittsburgh 19, Pa.
Potter Fire Escape Co., 6110 N. California Ave., Chicago 45, Ill.
Powhatan Brass & Iron Works, Ranson, W. Va.
Pyrene—C-O-Two, Div., Fyr-Fyter Co., The, U. S. Highway 1, Newark 1, N. J.

R

Radio Corp. of America, Front & Cooper Sts., Bldg. 15-5, Camden 2, N. J.
Rad-O-Lite, Inc., 1202 Myrtle St., P. O. Box 306, Erie, Pa.
Reese, S. H., 57 Warren St., New York 7, N. Y.
Republic Rubber Div., Lee Rubber & Tire Corp., 1410 Albert St., Youngstown 1, Ohio
Rice Pump & Machine Co., 600 Park St., Belgium, Wis.
Rockwood Sprinkler Co., 38 Harlow St., Worcester 5, Mass.
Rose Mfg. Co., 2700 W. Barberry Place, Denver 4, Colo.
Rupert Parachute Co., Palatine Road, Wheeling, Ill.
Russell Fire Equipment, Div. Russell Uniform Co., 192 Lexington Ave., New York 16, N. Y.

S

Safa Alarm Div., Inc., Fyr-Fyter Co., The, P. O. Box 1118, U. S. Highway #1, Newark 1, N. J.
Santa Rosa Fire Nozzle, Inc., P. O. Box 94, Santa Rosa, Cal.
Schauer Mfg. Corp., 4500 Alpine, Cincinnati, Ohio
Schneck Textile Fibre Co., P. O. Box 473, Narbeth, Pa.
Scientific Electro Mechanical Industries Corp., 2910 Nebraska Ave., Santa Monica, Cal.
Scott Aviation Corp., 225 Erie St., Lancaster, N. Y.
Seagrave Corp., 2000 S. High St., Columbus 7, Ohio
Seiscor Div., Seismograph Service Corp., P. O. Box 1590, 6200 E. 41st St., Tulsa 35, Okla.
Signal Electronics Co., 417 E. 19th St., Bakersfield, Cal.
Sireno Signal Mfg. Corp., 65 Passaic Ave., Kearny, N. J.
Smith, D. B., & Co., 406 Main St., Utica 2, N. Y.
Snorkel Fire Equipment Co., Grand View, Mo.
Snyder, M. L., & Son, Inc., 2417 N, Jasper St., Philadelphia 25, Pa.
Sponco Aerial Ladder Co., 1007 N. W. 36th St., Oklahoma City 18, Okla.
Stanton Scientific Equipment Co., Inc., 3024 Carmel St., Los Angeles 65, Cal.
Stephenson Corp., Box 392, Red Bank, N. J.
Sterling Siren Fire Alarm Co., Inc., 10 Bartlett St., Rochester 8, N. Y.
Stevens, S. G., Co., 3859 Lockwood Ave., Toledo 12, Ohio
Stonco Electric Products Co., 335 Monroe Ave., Kenilworth, N. J.
Sun Electric Corp., 6337 N. Avondale Ave., Chicago 31, Ill.
Superior Signal Co., Inc., 6 Colfax St., South River, N. J.
Super Vacuum Manufacturing Co., Inc., 1055 E. First St., Loveland, Colo.

T

Thermoid Div., H. K. Porter Co., Inc., 601 Grant St., Pittsburgh 19, Pa.
Trippe Mfg. Co., Trippelite Div., 133 N Jefferson St., Chicago 6, Ill.

U

U-C Lite Mfg. Co., 1050 W. Hubbard St., Chicago 22, Ill.
United States Rubber Co., 1230 Ave. of the Americas, New York 20, N. Y.
Universal Fire Apparatus Corp., P. O. Box 187, Wheatland Ave. & Center St., Logansport, Ind.

V

Valley Fire Truck Co., 59 Tuscola Rd., Bay City, Mich.
Venti-Breather Products, Inc., 725 - 15th St., N. W., Washington, D. C.

W

Washington Products Co., 240 S. Fayette St., Washington Court House, Ohio
Waterous Co., 80 E. Fillmore Ave., St. Paul 7, Minn.
Waukesha Motor Co., West St. Paul Ave., Waukesha, Wis.
W-B Manufacturing Co., 157 No. Wasco St., Wichita, Kans.
Wellco Chemical Co., 15 S. Austin Blvd., Chicago 44, Ill.
Wentworth-Forman Co., Inc., 116 Bedford St., Boston 11, Mass.
Western Fire Equipment Co., 69 Main St., San Francisco, Cal.
Wheeler Protective Apparel, Inc., 224 W. Huron St., Chicago 10, Ill.
Whelen Engineering Co., Inc., 42 Kirtland St., Deep River, Conn.
Wincharger Corp., subs., Zenith Radio Corp., E. 7th & Division Sts., Sioux City 2, Iowa
Wooster Brass Products, Fyr-Fyter Co., The, 1415 E. Bowman St., Wooster, Ohio
Worcester Brush & Scraper Co., 38 Austin St., Worcester, Mass.

Y

Young Fire Equipment Corp., 1548 William St., Buffalo 6, N. Y.

Exhibitors — IAFC Conference

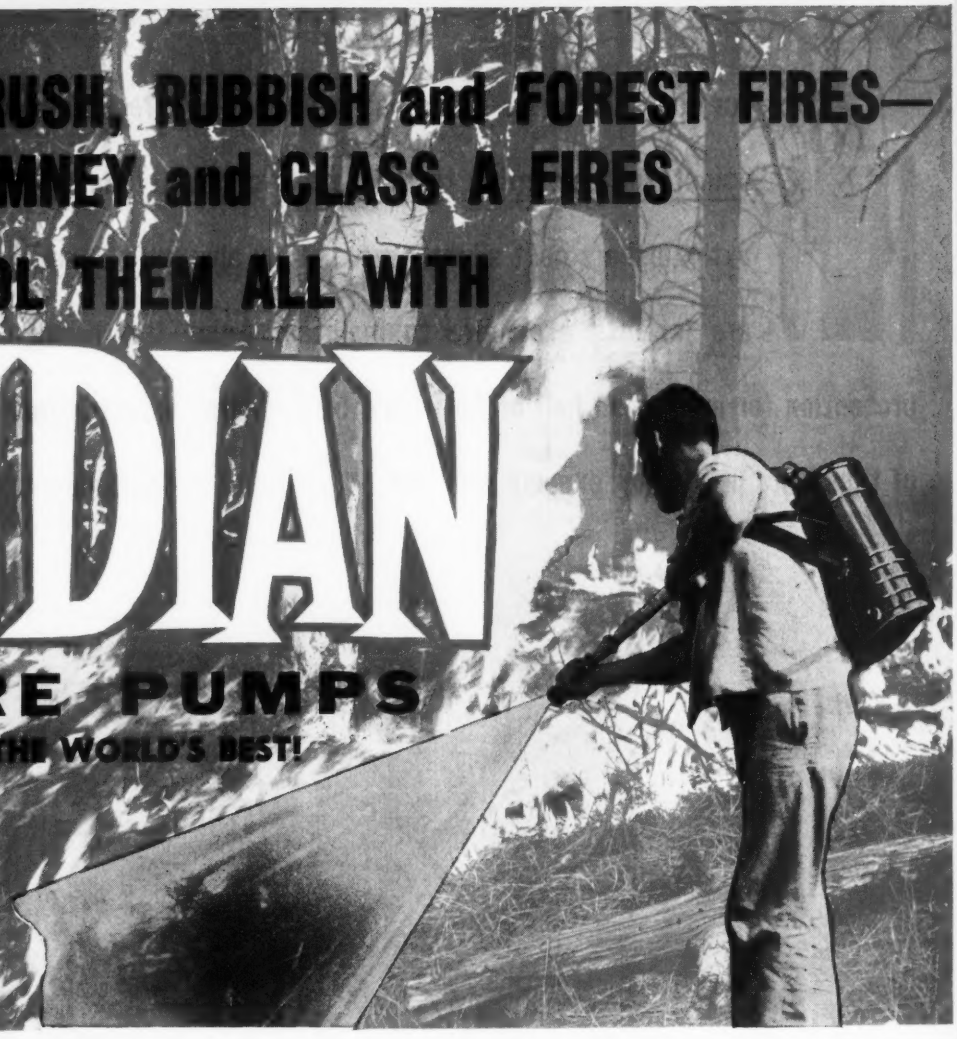
Convention Center, Las Vegas, Nev.

Company	Booth
Akron Brass Mfg. Co., Inc.	36
American City Magazine	142
American District Telegraph Co.	5
American Fire Alarm Co.	51
American Fire Apparatus Co.	40
American Fire Pump Co.	40A
American LaFrance Corp.	74
American Rubber Mfg. Co.	114
American Telephone & Telegraph Co.	27
Antrex Corp.	39
Arpin Co., L. G.	
Atlas Safety Equipment Co., Inc.	108
Batrow Laboratories	3
Bi-Lateral Fire Hose Co.	2
Boy Scouts of America	137
Camcone Products	54
Carpenter Manufacturing Co.	9
Casino Center of Las Vegas	106
Central Fire Truck Corp.	64
Chevrolet Central Office	104
Circul Air Corporation	75
Coast Apparatus	76
Comptometer Corp.	25
Cornelius Company	48
Crown Coach Corp.	60
Curtis & Sons, L. N.	10
Dictaphone Corp.	22
Divco Wayne Corp. (Miller-Meteor Div.)	143
Doho Chemical Corporation	53
Dominator Corporation	57
duPont de Nemours & Co., E. I.	29
Elkhart Brass Mfg. Co., Inc.	100
Emerson Company, J. H.	12
Eureka Fire Hose Div., U. S. Rubber Co.	26
Fabric Fire Hose Co.	69
Federal Sign and Signal Corp.	109
Federation for Home Fire Safety	112
Ferno Corp.	110
Fire Engineering	65
Fire Rescue Boats, Inc.	4
Ford Division	87
FWD Corporation	138
Fyrepel Products	35
Fyr-Fyter Company	42
Gamewell Company	85
G.M.C. Truck & Coach Div.	101
Globe Mfg. Co.	105
Goodrich Hose Co., B. F.	99
Greenberg's Sons Co., M.	18
Halprin Supply Co.	7
Hannay & Sons, Clifford B.	79
Hercules Motor Co.	62
Hewitt-Robins Mfg. Co.	11
Highway Products	
Howe Fire Apparatus Co.	72
Hydrojet Marine Corp.	118
Kohler Company	73
Leece-Neville Co.	30
Mack Trucks, Inc.	33
Maxim Motor Co.	41
McIntire Brass Works, F. N.	80
Metcalf Bros. & Co.	32
Mine Safety Appliances Co.	49
Minnesota Mining & Mfg. Co.	32A
Motorola C. & E., Inc.	63
Mueller Company	38
National Electrodynamics Corp.	52A
National Fire Protection Assn.	46
Nevada Club of Las Vegas	15
North American Signal Co.	6
Nuclear Electronics Corp.	141
Ohio Chemical & Surgical Equipment Co.	23
Onan & Sons, D. W.	102
Oxygen Equipment and Service Co.	14
Pirsch & Sons Co., Peter	50
Plectron Corporation	55
Powhatan Brass & Iron Works	66
Prosser Industries, Inc.	103
Raeford Worsted Co.	98
Rockwood Sprinkler Co.	83
Santa Rosa Nozzle, Inc.	34
Scott Aviation Corp.	70
Seagrave Corp.	24
Signal Electronics Corp.	144
Simpson & Sons, Wm.	1
Snorkel Fire Equipment Co.	58
Stephenson Corp.	8
Superior Coach Corp.	67
Super Vacuum Manufacturing Co.	77
Trippe Mfg. Co.	13
Van Pelt, Inc., P. E.	126
Waterous Co.	71
Western Fire Equipment Co.	16
Westrex Corp.	56

Company	Apparatus Space
American Fire Apparatus Co.	"D"
American LaFrance Corp.	"A"
Central Fire Truck Corp.	"N"
Chevrolet Central Office	"R"
Coast Apparatus	"Q"
Crown Apparatus	"L"
Divco Wayne (Miller-Meteor Div.)	"Z-2"
Fire Rescue Boats, Inc.	"E"
Ford Division	"U"
FWD Company	"Z"
G.M.C. Truck and Coach Division	"S"
Howe Fire Apparatus Co.	"O"
Hydrojet Boats, Inc.	"Y"
Mack Trucks, Inc.	"F"
Maxim Motor Co.	"P"
National Electrodynamics Corp.	"M"
Pitman Snorkel	"K"
Seagrave Corp.	"I"
Van Pelt, Inc., P. E.	"W"

GRASS, BRUSH, RUBBISH and FOREST FIRES—
ROOF, CHIMNEY and CLASS A FIRES
CONTROL THEM ALL WITH

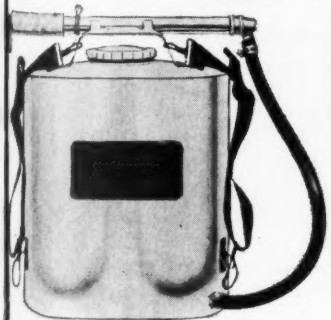
INDIAN
FIRE PUMPS
THE WORLD'S BEST!



over 30 years INDIANS have been putting out small
s before they grow into big ones. Today's models
e been improved and it is a pleasure to operate
m. Fire fighters call the INDIAN "a one man fire
partment" and tell us "they are worth their weight
gold."

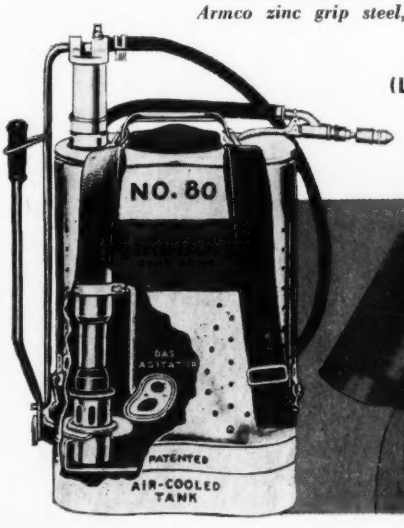
No. 90 sliding pump type shown above. Available in Armco zinc grip steel, solid brass or Chrome tanks.

o. 90 INDIAN FIRE PUMP (FIBERGLASS TANK MODEL)



Send for circular on our new **No. 90 FIBER-GLASS** tank model. Light weight. Will not rust or corrode. New, shorter brass pump.

All models of INDIAN FIRE PUMPS are approved by Factory Mutual.



No. 80 INDIAN
(Lever Type Pump and Handle)

Continuous high pressure. Pump throws strong stream or nozzle adjusts for spray or fog mist. Sturdily built to give many years of service.

D. B. SMITH & CO. "FOR 73 YEARS THE LEADERS"

406 Main St., Utica 2, N.Y.

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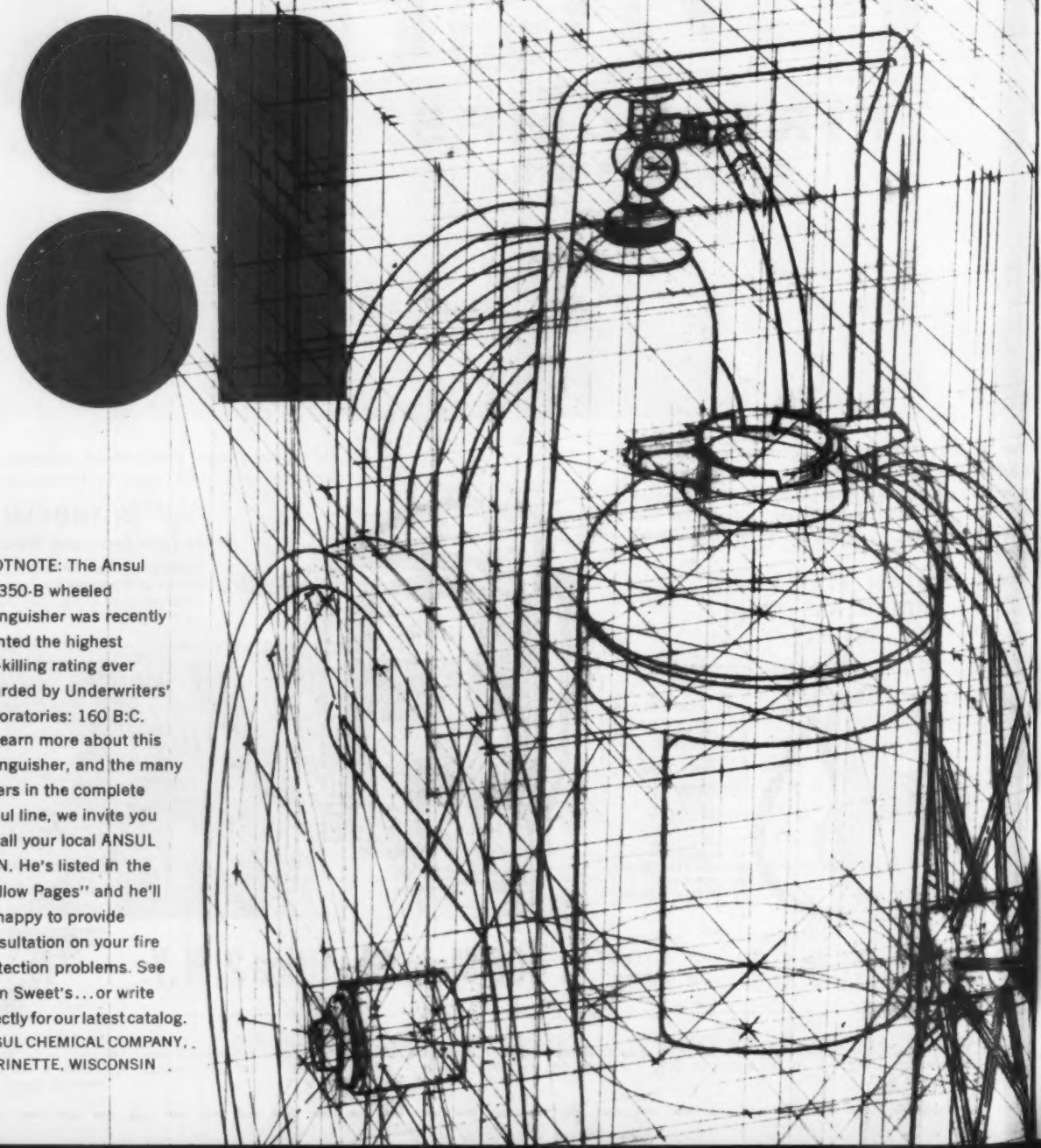
For some 20 years Ansul has been making fire extinguishers...with careful, painstaking attention to the details of quality, design and performance. Our extinguishers cost slightly more! They also put out more fire, last longer and are far less expensive to maintain. Ansul fire extinguishers provide basic protection for more than half of America's 500 largest industrial firms...are first choice of those fire protection experts who look at price but understand value. **ANSUL**



FOOTNOTE: The Ansul HF 350-B wheeled extinguisher was recently granted the highest fire-killing rating ever awarded by Underwriters' Laboratories: 160 B:C. To learn more about this extinguisher, and the many others in the complete Ansul line, we invite you to call your local ANSUL MAN. He's listed in the "Yellow Pages" and he'll be happy to provide consultation on your fire protection problems. See us in Sweet's...or write directly for our latest catalog. ANSUL CHEMICAL COMPANY, MARINETTE, WISCONSIN

What's new . . . among the manufacturers

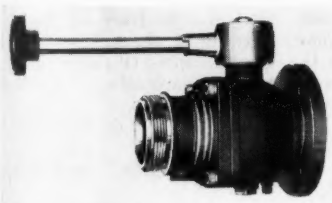
products · processes · personalities

Box 15 Club To Again Entertain Chiefs

Box 15, equipment suppliers club of the Great Lakes Division, will again host the chiefs of the division and their wives at the annual conference of the IAFC to be held in Las Vegas in September. This will be the third time this popular organization has entertained and Great Lakes members look forward to it as one of the highlights of each convention.

The annual cocktail-dancing party will be held at the Riviera Hotel in Las Vegas on Monday, September 25, at 8:30 p.m. Admission will be by ticket only, which will be distributed to Great Lakes chiefs by club members at the annual meeting of the division earlier in the day.

Box 15 re-elected its officers for 1961. They are: President, C. T. McGraw, Circul-Air; vice president, "Stu" Spalding, Eureka Fire Hose; Fred Fischl, Bi-Lateral Fire Hose, is treasurer and Grace Clark, Circul-Air, secretary. Directors include Lloyd Schafer, Gamewell Co.; Willis Barton, representative for American Fire Apparatus and Fabric Fire Hose; and "Spud" Van Gorp, Seagrave Corp. Other members, all well-known vendors to the fire service are: Joe Fishelson, Akron Brass Mfg. Co.; Marty Paye, E & J and Scott Aviation; Joe Platte, Bi-Lateral Fire Hose Co.; Bob Casse, Midwest Fire & Safety; Bill Birch, Birch Fire Equipment; Jim Fenton, Fenton Associates; Mike Dalton, Great Lakes Fire Equipment; Ralph Banks, Scott Aviation; George Clark, Fyr-Fyter Co.; William Pirsch of Peter Pirsch & Sons; Art Moore, Pittman Mfg. Co.; Bill Stoner, Seagrave Corporation; and R. W. Shook, Elkhart Brass Mfg. Co.



New Elkhart Valves

Elkhart Brass Mfg. Co., Inc., Elkhart, Ind., has announced what is said to be an entirely new line of locking-handle suction, discharge and inline ball valves. Available in 1-inch, 1½-inch, 2-inch and 2½-inch sizes, they have a patented seat which it is claimed can be adjusted in place, and is shorter and lighter with increased waterways.

Improved Indian Pump

D. B. Smith & Co., Utica 2, N. Y., has announced improvements in its all-brass Indian Fire Pump No. 90. The pump has been shortened to 18 inches and fitted with a 90-degree elbow hose fitting. It may be carried on an extra snap provided on one carrying strap so that the bearer's arms are free for climbing, etc., yet the pump is quickly available for use.

Sponsors Turtle Club

E. W. Bullard, president of the E. D. Bullard Co., 2689 Bridgeway, Sausalito, Calif., safety equipment manufacturer and supplier, is the international sponsor of the Turtle Club, a world-wide organization of men whose lives have been saved by, or have been protected from injury, by a helmet, hard hat or cap. The club's motto is "Shell on head—we're not dead!"

Recent memberships include Captain Glen Curtis and Firemen Delvan Tye and Lawrence Riepe of the Griswold, Iowa, Volunteer Fire Department. These men were injured when a cement and brick cornice collapsed, knocking them from a ladder. Fire Chief James R. Lindvall credits the "Hardboiled" fire helmets the men were wearing as preventing serious head injury or death.

New John Bean Film

John Bean Division, Food Machinery and Chemical Corp., Lansing 4, Mich., has made a new 16 mm. sound color film which describes all its apparatus, including pumpers and ladder trucks. Also shown are scenes from the company school featuring fire attack with high-pressure fog. It is available on a loan basis by contacting the Fire Fighter Department.

Snake Bite Kits

A. E. Halperin Co., Inc., Boston 18, Mass., is marketing its Halco No. 16W snake bite kit for removing venom by use of suction. Packed in a lightweight, hinged-cover box, it contains suction syringe, tourniquet, lancet and other first-aid supplies.

LaFrance Appoints New Chicago Distributor

American LaFrance, Elmira, N. Y., division of Sterling Precision Corp., has appointed the newly formed American LaFrance Sales and Service of Chicago, Inc., as distributor of its fire extinguishers, fire protection systems, fire hose and fire fighting chemicals in Chicago and 13 nearby counties. The new company is headed by Earl A. Larson and Dudley R. Styles, both formerly of the LaFrance factory sales staff, and will continue to occupy offices at 445 North Lake Shore Drive, Chicago 11.

Kahl Radiameter

Kahl Scientific Instrument Corp., P. O. Box 1166, El Cajon, Calif., is marketing its Model FH-40T Radiameter, a personnel monitoring instrument for use in nuclear radiation areas. Claimed to be simple to operate and versatile in use, it is said to give audible or visual indications.

New Faraday Local Boxes

Farady, Inc., Adrian, Mich., is marketing redesigned call stations for interior alarm systems. Designed for use with the company's new modular and compact fire systems and flush-mounting over standard single wall boxes, they are said to feature Alert-O-Glass which changes color and conveys a sense of animation when viewed from different angles.

Continued on page 852

False alarms

Annexation Dividend

Mayor Ben West of Nashville, Tenn., recently received a letter from a woman in an annexed area where city services had just been extended.

"The dogs are beginning to 'set up and take notice' as the new fire plugs are being installed," she wrote. "It is refreshing to know there will be some relief for my shrubbery."

"I didn't want to marry him for his money," explained the lady to her friend, "but how else could I get it?"

"Well, what are you selling?" growled the gruff prospect, looking up from his desk.

"N . . . nothing, sir," stammered the timid salesman, and is my boss raising hell!"

A clerk was handed a pay envelope which, by error, contained a blank check. The astonished clerk looked at it and mourned: "Just what I thought would happen. My deductions have at last caught up with my salary."

The pastor of the church was in his study, preparing his sermon when his phone rang. Picking up the receiver he was surprised to hear the voice of one of the deacons on the other end of the wire saying, "Hello, Joe? Send me over a quart of bourbon and a fifth of gin. I'm giving a poker party tonight."

The irate minister could hardly control his voice as he spoke into the mouthpiece: "Deacon Jones! I'll have you know this is not Joe, this is Reverend Smith you are speaking to!"

There was a pause, then Deacon Jones said: "Why Reverend Smith! What are you doing over at Joe's?"

What About You?

A lot of men are like wheelbarrows—not good unless pushed.

Some are like kites—if not kept on a string they'll fly away.

Some are like canoes—they need to be paddled.

Some are like kittens—they are more contented when petted.

Some are like balloons—full of wind and ready to blow up.

Some are like trailers—they have to be pulled.

Some are like lights—they keep going on and off.

Some are like chills and fever—alternately hot and cold.

And many are like the North Star—always there when you need them, dependable, loyal and a shining light to others.

Chief Ben S. Huron

Hardrock describes a conscientious husband as one who tells his wife everything he thinks she's already found out.

The young rookie was out for a ride with his girl. Driving with one arm around her, he speeded up until he was doing 70 miles per hour.

"Use two hands, use two hands," beseeched the frightened miss.

"I can't," replied the probie. "I've got to drive with one."

An Englishman visiting his son, during his first year at Cambridge University, was being taken on a tour of the place by the boy. As they walked along, a very formidable woman strode by, nodded briefly and went on.

"That's Miss Ekhart," explained the youth. "She's the mistress of Ridsley Hall."

His father shook his head unbelievingly. "And who," he asked, "is Ridsley Hall?"

St. Paul Fire Fighters

An elderly couple from the country approached one of the ticket windows at the railroad station. Obviously uneasy amidst big-city surroundings, the little lady asked:

"How much is the fare to Waynesville?"

"That's $4.65, ma'am," replied the clerk.

"Well, papa," she said, turning to the old gentleman beside her, "we might as well buy the tickets here. I've asked at all these windows and they all charge the same."

Prejudice is a great time-saver. It lets us form opinions without bothering to get the facts.

Sold to Benton Harbor, Michigan,
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ENGINE: Waukesha or Hall Scott Single or Dual Ignition to 300 HP.
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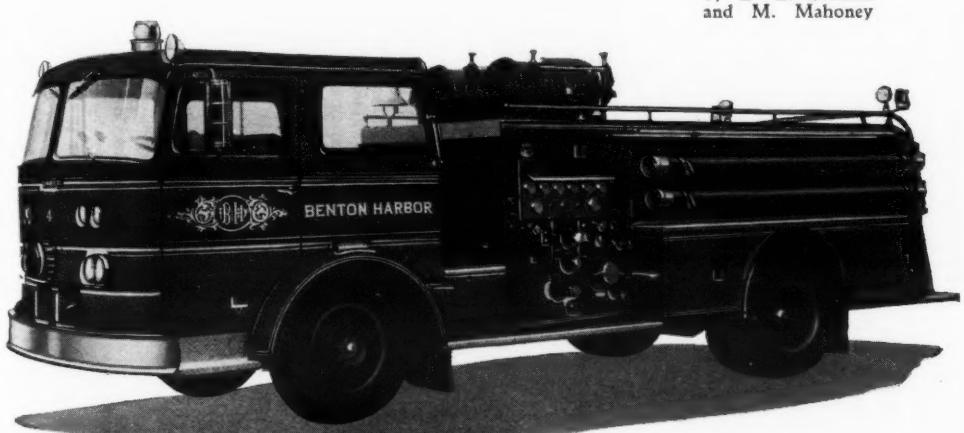
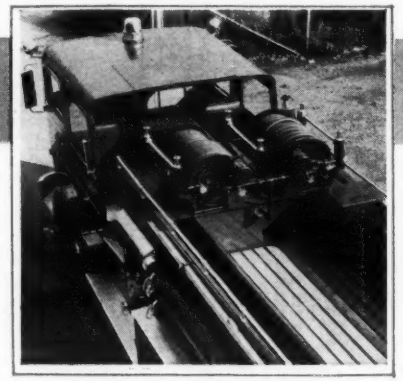
ENGINE: Waukesha or Hall Scott Single or Dual Ignition to 300 HP.
STEERING: Ross standard — Vickers power steering optional.
TRANSMISSION: Fuller 5-speed standard — Spicer Syncromesh or Turbomatic automatic transmission optional.
AXLES: Timken Model FE-900 front. Timken Model QT-140 rear.
WHEELBASE: 160" standard; longer available for special applications.

FIRE EQUIPMENT

PUMP: Waterous 500 gpm to 1500 gpm famous Electro-Matic, with split case design for easy servicing.
BOOSTER TANK: Capacity optional. 10 gauge steel thru-out with highest percentage copper content available. Supplied with Howe's exclusive spill-proof type front tank filler.
HOSE BODY: Heavy gauge cold rolled stretcher leveled automotive body steel.
COMPARTMENTS: Customized to customer order.
WARNING SIGNALS AND LIGHTING: Siren optional; 2 hose body lights; 2 pistol grip spot lights; 4 headlights; 2 tail-lights. 2 underhood trouble lights, pump panel light.
EQUIPMENT: Ladders optional; 2 - 10 ft. lengths pump suction hose and fittings; axe; crowbar; pike pole; hose reel. Extinguisher, lanterns, hose, nozzles, etc. to customer order.
FINISH: F. D. red with genuine gold leaf lettering and striping. Special emblem to order.

Sold to Benton Harbor, Michigan, by E. L. Schultz and M. Mahoney





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Howe Defenders are built to meet the customer's individual needs — let the Howe engineering staff recommend the pumper that will best serve **your** locality.

Howe Defenders are effectively serving throughout the country in such centers as Dallas, Houston, St. Louis, Birmingham, Ft. Lauderdale, Jamestown, N. Y., Muncie, Ind., Gastonia, N. C., and in many government installations.

Depend on Defender — custom-built by an experienced, old-line company.

The Benton Harbor, Michigan, unit shown above and at left features: the 5-man canopy-type cab having removable section in top of cab for easy access to engine; dual ignition system; Spicer automatic Model 183 "Turbomatic" transmission; Waterous CM-1000 Electro-Matic 1000 gpm two-stage pump; two electric rewind hose reels; 500 gallon booster tank; four large side compartments; two large rear compartments.

HOWE

"dependable fire apparatus since 1872"

FIRE APPARATUS COMPANY **Dept. FE 91 Anderson, Indiana, U.S.A.**

HF HOWE

SAN DIEGO FEELS THE PINCH

Continued from page 756

estry. Now the Del Mar Fire Department, hardly wet behind the ears, cannot foretell its future status. If annexed by San Diego, will it be absorbed or wiped out at the stroke of a pen? Meanwhile, its fire fighters enjoy the unique experience of watching brother firemen of San Diego (from Engine 15 and Pumper-Ladder 24) streak through their main street, Route 101, headed for an incident that could well be just over their northern border. If given the jurisdiction they could handle such calls fully 15 minutes ahead of the San Diego units rolling from far away LaJolla, which long ago became annexed to San Diego. It seems the big city has crept around little Del Mar over the years, to reach some 6 miles farther north to exclusive Rancho Santa Fe.

To the south, San Diego's territorial conflicts have been with the newly incorporated City of Imperial Beach, and with Chula Vista, both of which boast their own fire departments, independent of the big city which has almost engulfed them. Farther inland and eastward, San Diego has collided with the incorporation efforts of Lemon Grove and the City of La Mesa. Tucked in between La Mesa and Lemon Grove lies still another fast-spreading incorporated satellite, El Cajon (population nearly 40,000) which suffers from annexation ailments in which its fire fighters share.

All the way up and down the county freeways and highways leading north and east, are other hamlets and settlements, some no more than a realtor's dream, but all primed with possibilities of expansion, should the future maintain its present pace of progress.

San Diego Fire Department Stations 30, 31 and 32 and Fireboat Station 33 have gone into operation within the past two years, all to meet the demands for fire protection engendered by the city's explosive expansion, in which annexation played its part. Additional stations are planned or under construction in order to fulfill the underwriters' recommendations. A $47 million civic center reportedly will have a new central fire headquarters.

Smaller districts affected

Discussing annexation, and its effect upon the fire services, the chief of a small unincorporated community fire department said it should be remembered that all the pains and aches of annexation are not peculiar to the big city of San Diego and its fire department alone, or even its satellite incorporated cities and their fire forces. "We, in the smaller outlying districts are getting our share," he said.

Available land that offers the slightest prospect of promotion is being grabbed up by promoters. The question of fire protection in these developments gets attention largely as a sales issue. It is considered good business to be able to say "our Outfall Hills will have all the utilities including fire protection," the chief said, "but when the promoters get together with our town administrators, as head of the department I submit my 'guestimates' on what it is going to cost to provide Outfall Hills that protection—the hydrants, communications, extra men and equipment needed (in our case volunteers and water transport)—and the annexation picture takes on a different hue."

This chief maintains that every annexed area adds just so much to the taxing problems. The community can include the financing of certain utilities like sewers and water mains (where there is hope of getting water) in the "packaging" it gives the realtors

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This is COMPLETE, INSTANTANEOUS fire protection for municipal and industrial use by NOTIFIER—the nation's foremost manufacturer of fire detection and notification devices.
This is the last word for fire protection and security control for commercial facilities, factories, institutions and military installations.

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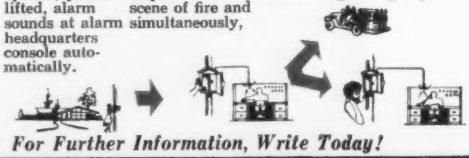
INSTANTANEOUS ACTION IN CASE OF FIRE:

Fire is discovered, alarm station door opened, phone lifted, alarm sounds at alarm headquarters console automatically.

Lights indicate alarm box number. Fire apparatus dispatched to scene of fire and simultaneously,

Person reporting fire, by phone, gives fire department full details concerning emergency.



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Refer to our catalogs 16A in Sweets' Architectural File and C6 in Sweets' Plant Engineering File NOT

NOTIFIER FIRE ALARM

NOTIFIER CORPORATION
3716 North 56th St. Lincoln, Nebraska

or promoters for annexing up, and they, in turn, can, if they so desire, include and pass along the costs of such improvements in the packages they sell their prospects, but it seldom works out 100 per cent. Sometimes it is the community that is left holding the bag —and not infrequently it is the fire department that feels the pinch.

Without increased facilities

In Rancho Santa Fe, it is stated as a fact that no "Ranch" householder can erect even a mailbox out front without its being passed on and approved by the governing board. The "Ranch" seems to be annexing more territory and the volunteer fire department is caught in the middle. Recently, three additions were annexed: Sun Valley, Monticello and part of Oliverheim. Most of the annexed area is acreage. Oliverheim added only a few dwellings and 300 acres to the tax roll. Monticello brought in some 256 acres and 56 homes; Sun Valley increased it by another 44 houses. Not much, in the aggregate, it may be observed. But the point is that, once annexed, the "Ranch" Fire Department is obliged to furnish fire protection, at this writing, without benefit of increased departmental facilities; this, notwithstanding the fact that the "Ranch" stipulates the extent to which the new subdivisions must provide certain fire protective measures.

Only Monticello has fire hydrants and can contribute anything substantial in manpower and equipment toward expanding the fire department's resources to supply the extra fire protection. "Regardless of the nature of the annexed area— barren or built up," states Fire Chief Jim Fox, "our fire department must make necessary inspections, check on fire hazards of field and ranch and farmhouse, and preplan for possible trouble even if only a canyon blaze." Incidentally, the Rancho Santa Fe Fire Department actually derives some income from its big city brother, San Diego, by providing protection under contract for the area within the Ranch's boundaries, which contains one of the city's water supply reservoirs. The contract term is a modest $10.00 yearly.

One of the largest and fastest growing of San Diego's immediate neighbors is Chula Vista (population 42,350 as of 1960). It, too, suffers from annexation growth. In the last five years Chula Vista has tried to assimilate annexed territory that has expanded its boundaries from about 4 square miles to 12 square miles.

Right now, a piece of suburban property over 5 miles from the nearest

SAWZALL SAVES LIVES!

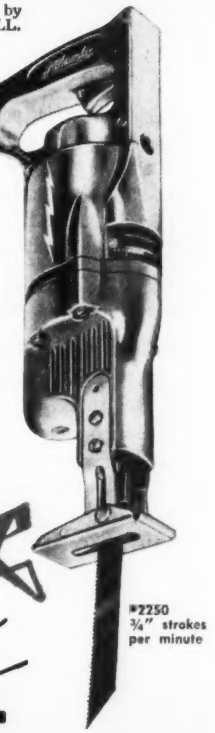
Injured woman being quickly and safely removed from wrecked car by Atlanta, Ga., firemen shown sawing through car panel with SAWZALL.

• Seconds count in any emergency! And that's when you can count on SAWZALL. It cuts fast* ... in metal, wood or any sawable material ... runs cool and is easy to maneuver with one hand.

The perfect and ***proven*** rescue tool ... acclaimed by hundreds of fire and police departments. As one chief puts it "It's great for cutting lock bolts in those thick doors and prevents breaking glass." No fire or heat hazards. Fast and safe, too, for removing youngsters stuck in grates, railings, etc.

Milwaukee-built 115V. AC-DC motor. Operates off alternator or other electric generating equipment. Ball and roller bearings. Weight 6¾ lbs. Length 14½". Furnished in steel carrying case with full set of assorted blades for sawing all materials **$94.50**

Act now to equip your fire, safety and rescue crews with SAWZALL. Be ready for every emergency or forcible entry need. **Write for Bulletin SW-6, Milwaukee Electric Tool Corporation, 5354 W. State St., Milwaukee 8, Wis.**



*2250 ¾" strokes per minute

Milwaukee SAWZALL

The ORIGINAL and FINEST Portable Power Hacksaw

Chula Vista fire station is up for possible annexation. To reach it, the city will have to protect also a narrow corridor of property leading the 5 miles to it. The department is informed that there will be about 450 dwellings to start with. And the Chula Vista chief has little to say concerning the problem of fire protection and prevention for this annexed area until buildings are under construction. All the fire department is told is that "we are going to have 500 homes by the end of 1961 and 1,000 at the close of 1962." And the chief is asked: "What is it going to cost us to have fire protection?"

How can a fire chief answer such a question intelligently, lacking the essential facts about water mains, hydrants, communications facilities and related elements which are all part of the annexation fire protection picture? Granted these data are available, the next question is: "Can the chief add in the cost of the additional fire station or other permanent facility that may be required to provide protection, if not immediately, at least by the time the 1,000 homes are erected, along with churches, shopping and professional and service areas, installations, etc.? Where to draw the line? How far can the developers and promoters of this development, to be duly annexed in time, be made to accept the responsibility for and finance the requisite fire protection services?

In the case of this particular annexation, Chula Vista's fire department escapes one growing pain that has plagued so many cities. That is the assimilation or elimination of an existing fire department as part of the annexation deal. Chula Vista's new area starts from scratch, whereas San Diego, for example, during its many annexations has often had to face up to this perplexing question.

Of all 10 incorporated, and the many unincorporated political subdivisions in San Diego County, only one strangely enough, cannot expand area-wise. That is Coronado. Coronado is a peninsula, an entity unto itself, just a hop across the bay from San Diego. The incorporated city is populated almost entirely by Navy personnel. Fire Chief E. F. Kohl, whose protection problems include assisting the 11th Naval District's fire fighters on the peninsular to protect the vast North Island Naval Base, the many aircraft carriers and other ships that dock at Coronado, did receive one jolt, however. It seems Coronado's voting population elected to construct a group of 10-story modern apartments facing the harbor—"and our department, with only two companies in a single station, and no aerial ladders closer than San Diego across the bay," mused Chief Kohl. □□

CHICAGO BOATS

Continued from page 757

one 19-foot boat in service and four 24-foot boats on order. Shipment is expected shortly. This will permit the department to maintain one of these units in or near each small harbor area.

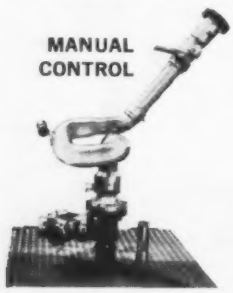
The majority of boat traffic around Chicago is the small pleasure-craft type. Thousands of these boats take to Lake Michigan, the Chicago River, Lake Calumet and the Calumet River each summer. The five jet units will be patrolling in assigned areas which will put them only minutes from any point in the city's waterways.

Of course, the small units cannot pump as much water as the big boats. Chicago has three large fire boats, all capable of pumping 14,500 gallons a minute, with a top speed of 14 knots. The big boats are stationed in areas where they are close to large piers, ocean-going vessels and grain elevators. □□

Maximum drenching power — for pumpers, trucks, fireboats, aerial platforms, fixed emplacements for missile firing pads and test stands. Remote controls available for all applications.

UP TO 4000 GPM CAPACITIES

Powerful striking force at greater distances is possible with Cromer lightweight "balance loop" design. This patented feature of Cromer Intelli-giant Monitors practically eliminates friction loss—makes handling much easier. There is no division of the stream—no internal obstruction. Both hydraulic and manual control models can be operated by one man—either at the monitor or by remote control. Available in five standard sizes from 2" to 6"—capacity range from 800 to 4000 GPM—in stainless steel or carbon steel. Interchangeable nozzles for fog, foam or straight stream available.



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2138 East 88th Street, Los Angeles 3, California

Among the buffs

By PAUL C. DITZEL

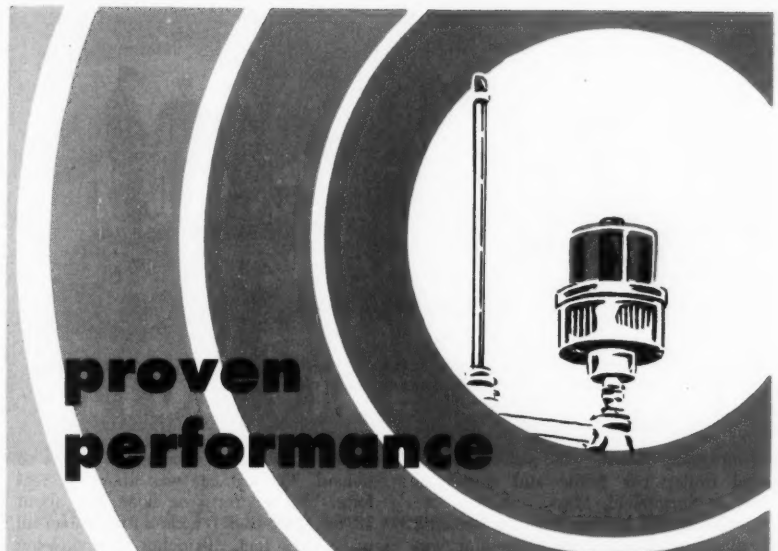
NEVER A DULL MOMENT in Massachusetts: Fans Perkins and Deane, erstwhile soft-shoe-routine pair from the Boston Sparks Association, varied their usual diet of turning out for early morning blazes by stomping off to the Old Howard Burlesque House when Box 1324 at 12:04 p.m. on June 20, was followed by a deuce and three-bagger. The blaze was a corker, but the story they are telling the rest of the Sparks concerns Deputy Chief Flanagan. While the chief was battling the fire, former burlesque queen Ann Corio ran up to him, threw her still shapely arms around the chief and wept on his shoulder. The Sparks official report says 20 gallons of lemonade were dispensed by the canteen at the blaze, but fails to say how much business they did in salt water taffy.

Over in Newburyport, the sparks are getting lots of mileage about the story of a fire—in of all places—a submarine. The blaze sent up a column of smoke visible for miles, but fortunately the fire in the "Haddock," a World War II sub being dismantled, did slight damage, according to the report in Boston's Box 52 Association *Newsletter*.

Paul L. Nelson, 209 Shute Street, Everett, Box 52 *Newsletter* editor, also reports how member Bob Fitz, in company with Fire Chief Carl Davis of Lynnfield and George Holden, a Wakefield buff, happened onto a large barn fire. The trio tried to free the calves and other animals but found that some of the calves were tethered. Brer Fitz then remembered his Mack pocket knife given to Box 52 members by Frank Harrington at the "Apparatus Night Meeting." The calves were then freed, but not before one argumentative cow butted Buff Holden into the dung pile in the back of the barn. Comments the Box 52 Association: "Sounds like a job well dung." (Remarks like that one make the daily reading of the mail a sometimes fascinating chore.)

No report as of this writing from the International Fire Buffs Association Convention just ended in Chicago. Knowing my old home town as I do, I'm certain that the stalwarts put on a good show. One of those who attended was Tom Jewett, the Lowell Thomas of buffdom. Tom zipped up to Chicago soon after returning to Kansas City following a five-week tour through The Old South. Tom, who is an ambassador of good will for Snorkels, too, sent along a most interesting souvenir which is now keeping my well-spotted tie out of my soup.

Buff Frank Lovering, 3 Lovering Road, (dig that address!) Medford 55, Mass., sends along a photo of an Amoskeag



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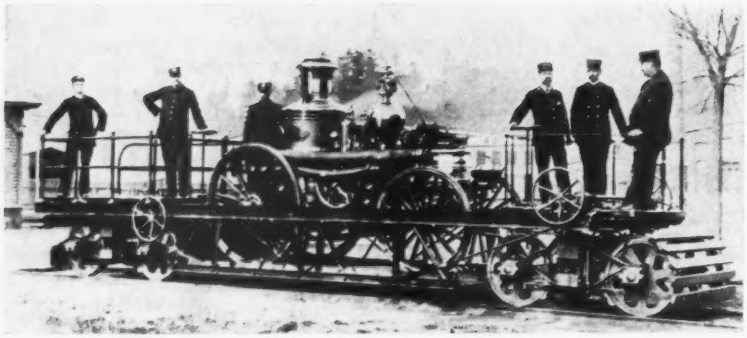


Amoskeag engine on special trolley truck was continued in service for some years after 1896 until fire stations were built near edges of city

steam pump which was put on a flat steel trolley car frame and towed to fires in Springfield, Mass., suburbs. The rig was carried by two trucks supporting a platform. Loading or unloading was done by cranking down the platform to the rails. The Amoskeag could then be pulled free after the front truck was disconnected.

"The truck was operated by chain hoists with right and left screws," says Lovering. "When the engine was run back to its floor the girders on the sides were bolted into place. Either a work car or a snowplow could draw the engine.

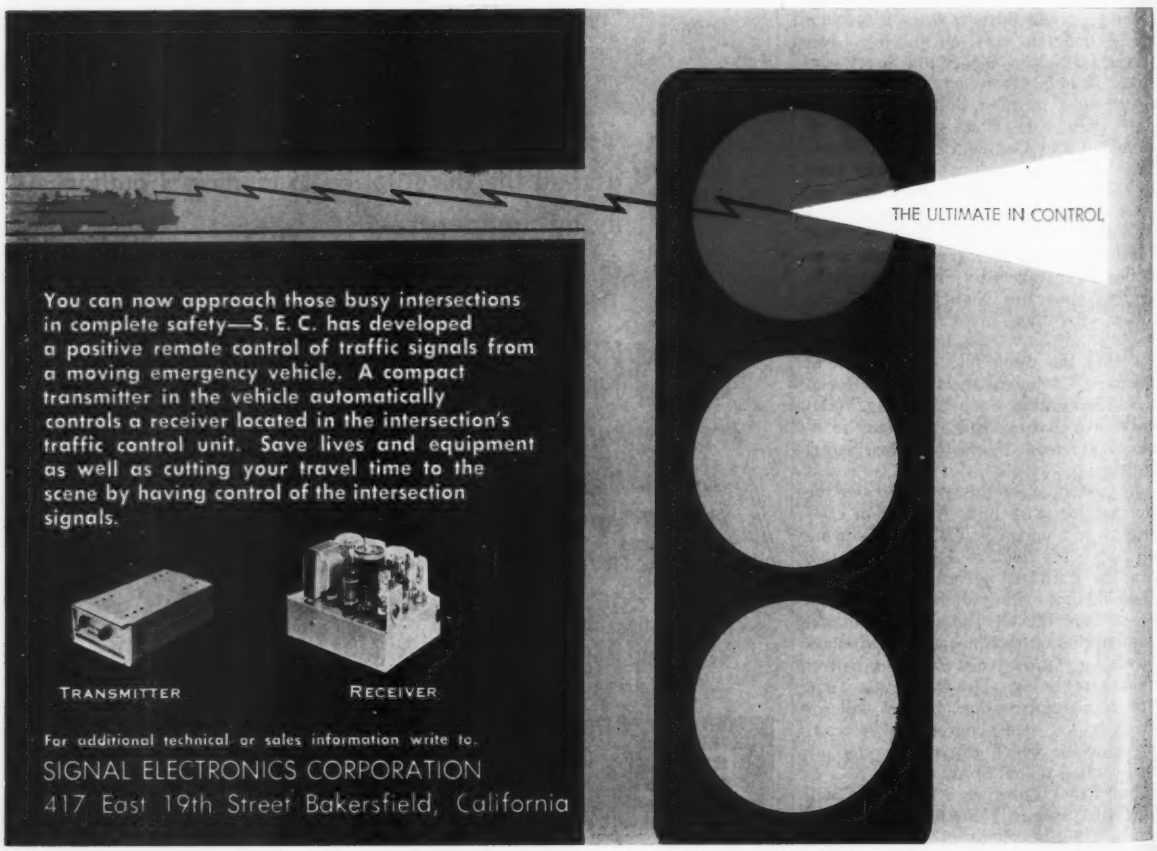
"The pump could be loaded in two and a half minutes. When taken from its carrier it required less than a minute to unload. The flat car was about 31 feet long. The platform or floor was about 13 feet long and 7 wide with an over-all width of 7 feet, 10 inches. The skeleton car with trucks and fittings weighed 7 tons."

Speaking of delayed alarms (which nobody was): The Third Alarm Association of New York City members are still shaking their heads over the fire in a Manhattan apartment house at 144th Street and Riverside Drive. The blaze was discovered in a closet of a sixth-floor apartment by six children. They were throwing buckets of water on the flames when their grandfather came home. He joined the bucket brigade which was fighting a losing battle. That the fire was well out of hand finally became apparent to the grandfather who sent one of the children to tell a neighbor.

The neighbor, kindly lady that she was, shared her bit of gossip with her daughter in *Queens*. A pretty good story, agreed the daughter, who passed it on to her husband. He seemed to recall that he had heard somewhere that it was a mighty fine idea to call the fire department when fire breaks out.

The hubby called the Queens FDNY Telegraph Bureau and reported the fire. Queens contacted Manhattan Telegraph and the alarm bells began to ping. They did not stop pinging, either, until the Manhattan pounders had banged out a 3-3 on Station 1621. Both the fifth and sixth floors were fully involved when first-due units hauled up to the six-story brick building. Firemen made a good stop and the fire only dropped to the fifth floor. But more than 250 persons had to be evacuated into biting cold weather.

The Third Alarmers also report that Lieutenant John M. Staib, Jr., of Engine Company 283, was presented "The Third Alarm Association Medal," and a $100 Defense Bond. The medal was presented by Mayor Wagner, with Commissioner Cavanagh and Deputy Commissioner Mand looking on. Lieutenant Staib was cited for a superhuman rescue of an ailing and aged man from an apartment house fire at 2472 Marion Avenue, Bronx,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on July 8, 1960, reports Editor Bernard Grandjany, TAA *News Bulletin* Editor, 235 West 71st Street, New York 23, N. Y.

Until the bells go down again next month, please continue to send your anecdotes, club reports, and comments to me at 4234 Don Diablo Drive, Los Angeles 8, Calif. Regretfully, letters cannot be answered other than through this column. □□

Heroic Volunteer Ends Peril of Gas Blast

John Southwell, a volunteer fireman, closed a valve feeding a propane gas fire, and removed a five-hour threat of disaster hanging over Perry, Mich., on June 2. An explosion shortly after 3 p.m. sent propane gas bottles flying around the storage yard of the Dri Gas Corp. The fire gradually subsided, but a 21,000-gallon tank, half filled with propane, posed an explosive threat of disaster for another five hours as flames licked at it. State police and fire fighters ordered the whole northeast third of the village evacuated, and cleared out about 400 of the village's 1,200 residents.

Fireman John Southwell shuts off main valve on propane gas tank under cover of water fog. Action removed threat of further explosion

When a high-pressure unit from a Lansing fire equipment manufacturing firm arrived, the tank was cooled enough to let Southwell get on the top to close the valve.

The storage yard is within 100 yards of the Grand Trunk Railroad tracks. East and west-bound Chicago-to-Montreal trains had to be stopped at Morrice, 2 miles east of Perry, and Shaftsburg, 5 miles west. Passengers were unloaded from each, shuttled by bus to the other train and continued on their way. No one was injured in the blast or fire. While the cause of the explosion has not been determined, the company's district manager said he thought it might have been a short-circuit.

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RESIDENCES AS FIRE STATIONS

Continued from page 753

activated in 1956) did have an attached garage big enough for the engine, but the door had to be raised and widened. Usually the original residential garage is used only for firemen's cars and limited storage space.

Each station houses a 750-gpm triple combination pumper, usually with a crew of four men. These companies each average about 20 runs a month, a third as much as one of San Jose's downtown units.

Rental on these houses runs from $100 to $160 monthly for a long-term lease, which usually includes a $500 bond insuring the city's restoration of the home to its original condition when it is vacated. The extra garage costs up to $2,000, but can easily be moved elsewhere when the temporary station is abandoned.

In tying outlying houses into the alarm circuits, San Jose is planning some further pioneering. The city uses the "phantom box" system (like most cities, its newer residential areas are not well covered by street boxes). All alarms are transmitted simultaneously to all houses by Vocalarm annunciator as well as telegraph. This means wire circuits must reach the temporary houses. Permanent cable installations are costly to put in and take out again. Besides, some locations could be reached by cable only if lines were strung along what are now country roads. Future road widening would mean extra line-moving cost.

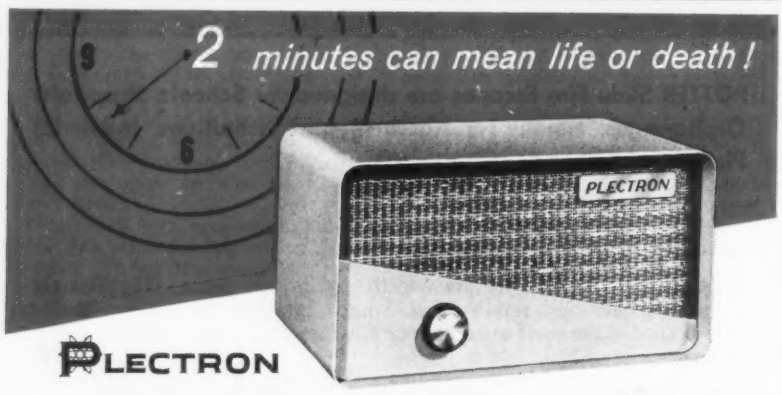
At present the city uses leased telephone lines to reach these four stations. But wire charges run high (over $95 a month for one station), and will go higher for future temporary stations farther out where toll cables must be used.

Plans for communication

After several years of watching nationwide developments in the communications field, San Jose officials feel a good solution is a 6000-megacycle microwave radio system to connect such outlying stations to alarm headquarters. A relay station on nearby hills will "bounce" signals to firehouses beyond the "line of sight" transmission distance from downtown. Both Vocalarm and telegraph signals, plus possibly several phone channels, will be relayed by microwave to the present Engine 17 and future Engine 18 by the end of this year. Equipment cost for the link involving these two stations will be $20,000; incremental cost to add more stations will run around $8,500 each. Transistorized equipment at the firehouses will operate on commercial power, with a 12-hour emergency battery "floating" on the line if power fails.

City Electrician George Praiswater says: "This will give us a positive, supervised system, which we do not have now with leased lines. We plan to monitor it at headquarters so that if power does fail at a station, we will know immediately and can get out there with an emergency generator long before the 12 hours are up." What about the Underwriters' view of such a system? City officials are confident, but no definite ruling can be handed down until the system is installed and operating.

Cables will go in when permanent stations are built later. Such building will follow this well-established plan: As soon as it is feasible to pick the sites and finance construction, three-door multicompany drive-through houses will be centered in high-value areas, usually as battalion headquarters. Farther out, in residential suburbs, smaller two-door permanent stations will follow. Local architects, under city supervision, have developed standard plans for each of the two types of station, making use of the suggestions of the firemen themselves for improvements in sta-



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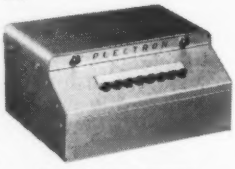

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tion design. Costs of these quarters are about $130,000 for the three-door, two-story unit, and $50,000 for the two-door. A $1,900,000 municipal bond issue voted in 1957 provided for eight of the big stations (plus apparatus, etc.). Some are still unbuilt, awaiting final site selection. A $965,000 issue just passed will provide for 10 of the smaller ones.

Typical growth story

Typical of the whole growth cycle is the story of Engine 10, first company to use temporary quarters. Before 1954, San Jose's West Side was farmland and fruit orchards. Then a major hospital was built, the huge Valley Fair Shopping Center was begun, and the first of thousands of new homes went up.

That August, the city leased a small concrete block building at $140 a month, designed as a firehouse with easy conversion to other use later, and put it in service. Soon afterward, final plans for a new state highway sliced right through the rear of this station. So in September 1956, the city moved its new Engine 10 to a residence two blocks away, leased at $135 monthly. When the highway came through, the first building was moved away and remodeled for commercial use.

Finally, when 1957 bond money was available and development patterns were firmly established (Valley Fair is now 56 stores covering 33 acres), a permanent multiple-company station was built nearby. Engine 10 moved in late in 1960. Next door is vacant land which will soon be occupied by scores of stores in another shopping center. The station is headquarters of the new Third Battalion, and a new aerial will be delivered there this summer, when the city's fifth truck company goes in service. The vacated residence has already been moved away to make room for still more highway work.

All four remaining temporary houses (Engines 9, 14, 15 and 17) operate now as "satellites" of this battalion headquarters, although some of them will be getting permanent buildings soon.

Newest is Engine 17 (the city's 16th engine company—there is no Engine 12 as yet). Here for the first time (November 1960) the city purchased a home outright instead of leasing it. Cost was $18,500, plus $2,000 for the 14 by 30-foot apparatus garage. Chief LeBeau says: "We do not expect much tangible cost saving as a major result of this program—the main thing is to protect the territory until permanent houses can be located. But we will recover our

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money on short-term residential purchases. We maintain a house in good order, with constant cleaning and upkeep, so it will be easy to resell at a profit when it is time to move." Each year property values throughout the area go up as much as 10 per cent.

Engine 17's territory had an especially uncertain future for months this year, while the University of California considered location of a major campus in the nearby foothills. Wisdom of the city's "wait and see" fire protection policy was justified by the final loss of the campus to a site in another county.

Chief LeBeau emphasizes that the temporary stations are just that. They have their disadvantages: Inadequate hose storage; no hose drying facilities; cramped room layout (though the congenial neighborhood setting and relatively light duty help compensate the men for this). On the other hand, he does not feel it is valid to object that the apparatus garage's lack of heat makes the whole idea bad for colder climates (lowest winter temperature here is 20 to 25 above, a few nights each year). In his opinion, readily available engine block heaters take care of this deficiency.

It is expected that as current temporary houses are replaced, others will be established. Says the chief, "We definitely intend to go on with this program." The idea may be catching on elsewhere in the county. The neighboring city of Campbell just leased a residence as a temporary firehouse in a newly annexed area, paying $200 a month for a 24-month term. Other growth areas in the nation might also profit by San Jose's successful example. □□

LAS VEGAS

Continued from page 755

there are 129 boxes. Of the alarm cable, 78,000 feet is underground, including all of the downtown area, and 37,000 feet is overhead.

Alarms are given to stations by three steps: Vocal, followed by printed dispatch on the circuit, followed by radio verification. Las Vegas is on the same frequency as Clark County.

The department made good use of its funds to build three new stations—two for expansion and one for relocation. Station 2 on Charleston Boulevard was relocated. "The city had grown in a different direction and the station was of declining value to us," recalled Chief Williams. "Then we built a new station, No. 4, in the industrial district. This house has adequate space for reserve apparatus and our own shops. Station No. 5 was built in the southwest area." In addition, the department has just completed modernization of its headquarters station, adding two apparatus stalls and expansion and reconstruction of dormitory and office facilities. The headquarters station was opened in 1945.

Expansion—good old growing pains—are the major problem facing the department in the near future, according to Chief Williams, a member of the department since 1942.

"Our city subdivision ordinance provides that hydrants and adequate water be provided with new tracts. This facet of expansion has not given us any big headaches. But as the city spreads out more, we must plan ahead with the new subdivisions to insure that we will have properly located station sites in the future. For example, in the southwest area, there is a major residential development under way. We checked and picked out a station site; I then asked the Underwriters for their opinion; the builder then called and said he was reserving a site. All three locations were practically identical. We hope to build this station in 1963. When the phone com-

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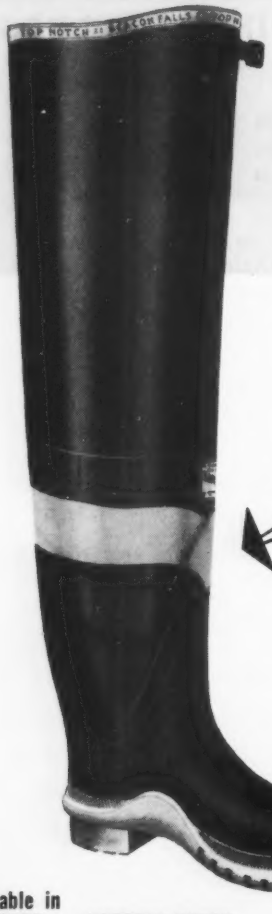

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pany puts in its underground lines, we'll go right along with our circuits."

County islands surrounded completely by the city—an irritant to the Las Vegas Fire Department—was solved March 29 when the legislature passed a bill which forced such islands to join the surrounding city.

Chief Williams speaks a bit bitterly about some of the fringe areas which refuse to annex to the city, but do not have adequate fire protection of their own at this time.

"I heard one fellow say in a hearing, 'Why should we annex and pay city taxes when we're getting fire protection for nothing?'

"Of course, we could refuse to give them protection, but the resulting bad public relations wouldn't be worth it—but the fact remains, they are getting our protection for nothing!" Eventual expansion of Clark County fire facilities may some day solve this problem.

One of the brightest of the fire department's relationships has been the tough building and safety code enforcement meted out by the municipal building department. Arthur Trelease, former fire prevention captain and later assistant fire chief, moved to the building department a few years ago and inaugurated the tough enforcement program.

"When you build in Las Vegas today, you do it right and everyone wins in the long run," the chief said. "In the downtown areas along Fremont Street where most of the big clubs and casinos are located, there has been much rebuilding and modernization. Everyone carefully checks plans with us, including sprinklers."

Chief Williams has many of the other problems which continually face fire chiefs the nation over—training facilities and manpower. The department has no training facilities, but occasionally gets a chance to have "hot" drills on old buildings.

Says Williams, "We have a regular training program, but a drill tower would help. This year we will get a drafting pit and I've had some informal discussions with Chief William Trelease of the county on perhaps some day building a joint city-county training center."

Las Vegas has a home fire prevention program conducted by engine company crews. It had a junior fire department at one time, but the program was dropped. The department maintains mutual aid agreements with North Las Vegas, Clark County and the nearby Nellis Air Force Base, but fortunately in recent years has been on the giving rather than the receiving end. □□

Ready for emergencies! Ken Burhop (right) Sheboygan Police Communications Officer, points out reliable features of Kohler plant to Fire Chief Ray Dionne (left) and Deputy Public Works Director Fred Wedemeyer.

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Association news

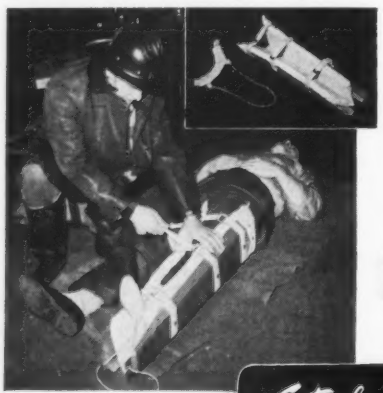
Smithtown Township Chiefs Install New Officers

Chief Robert Martin of the Nesconset Fire Department took over the reins as president of the Smithtown Township Fire Chiefs' Council at the second annual installation dinner at Robbin's Rest, Hauppauge, N. Y., on May 27. Other officers inducted with Chief Martin are: Assistant Chief Harold Luttmann, Smithtown, vice president; Assistant Chief William Voges, Nesconset, treasurer, and Assistant Chief John Baker, Kings Park, secretary. *Ernest G. Wilcox*

Rucker Heads Texas Group

Vernon Rucker, Killeen, was elected president of the State Firemen's and Fire Marshal's Association of Texas at the recent 85th annual conference held in Rosenburg. Other officers include: First vice president, W. E. Zorn, Del Rio; second vice president, Palmer West, Eldorado; third vice president, Norvall Terry, Weatherford; fourth vice president, Carol Shumaker, Alamo.

Over 2,000 representatives attended the three-day affair which saw outgoing president, C. H. Boring, Jr., Rosenburg, presented with an air-conditioned red station wagon, diamond-studded watch and a solid gold past president's badge. The 1962 convention will be held in McAllen, June 12-14.



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Combined Oregon Bodies Elect New Officers

The Oregon Fire Chiefs Association, the Oregon Volunteer Firemen's Association and the Oregon Rural Fire Protection Districts Association held their joint conference in Bend, Ore., on June 25-28. Officers elected included: *Fire Chiefs*—president, Vernon Carlon, Bend; first vice president, Harold Jacobson, Multnomah 13; second vice president, John Bornsteidt, Enterprise; secretary, Don Reinke, Salem. Ivan Pearson, McMinnville was re-elected treasurer. *Volunteer Firemen*—president, Dick McKee, Four Corners; first vice president, Don Souder, Bethel; second vice president, Jim Waterfield, Roseburg Rural; secretary, Alan Foster, Silverton; treasurer, Art Woeld, Four Corners. *Rural Districts*—president, Glenn E. Lenninger, Parkrose; first vice president, Fred Johnson, Canby; second vice president, W. H. Dana. Norma Pfeiffer, Coburg, was re-elected secretary-treasurer.

Jerry Davis is presented award for heroism by Retired Chief Edward Boatright, American Fire Alarm Co., Inc., as Chief Robert Prahl, Ontario Fire Department, looks on

Highlight of the conference was the joint presentation of the first Meritorious Award for Heroism by the Fire Chiefs Association and the American Fire Alarm Co., Portland, to Jerry Davis, 11, of Ontario. The young boy had on December 12, 1960, exhibited outstanding heroism by rescuing his brother Mark, age 2, from a bedroom of the family's burning home and then returning to the room to rescue his brother Neil, age 4. In addition, the association has asked Governor Mark O. Hatfield to recommend the boy for the Commendation Medal presented by the President of the United States, as well as the Young American Medal for Bravery.

Moulton Retires from NFPA

Robert S. Moulton, technical secretary of the National Fire Protection Association since 1928, retired April 30 after 41 years of service. He will be retained in a consulting capacity by the association to handle specified technical committee activities. During his long career, he served as editor of the *NFPA Quarterly*, successive editions of the "Handbook of Fire Protection" and of the National

Fire Codes. Among the founders of the Society of Fire Protection Engineers, he was elected secretary-treasurer when the society was organized in 1950 and has been re-elected each year since.

Custer Heads Arizona

The Arizona Firemen's Association, during its four-day convention in Williams, elected Jack Custer, Prescott fire chief, president, succeeding Assistant Chief Jake Siken, Phoenix. Jim Lauchner, Glendale, was named first vice president; Robert Saturley, Tucson, second vice president; and Earl Hunt, Safford, re-elected secretary-treasurer.

Named to the executive board's two-year directorships were Captain Willard Taylor, Phoenix, and Chief Ben Raebel, Yuma. William Moline, South Tucson, was named to a one-year term. Chief William Casson, Kingman, is holdover for another year. Chandler will host the 1962 convention.

E. W. Fair

Suffolk County Group Re-elects Officers

The Suffolk County Fire Districts Association recently re-elected the following officers: James Kent, president; James Murphy, first vice president; Fred Slater, second vice president; Alex Schultz, secretary; Nelson Van Wyen, treasurer; and Arthur Illingworth, sergeant-at-arms.

Ernest G. Wilcox

Nevada Elects Barton

Gary Barton, Hawthorne, was elected president of the Nevada Firemen's Association at the recent annual convention in Lovelock. Serving with him are: Jim Newell, Yerington, first vice president; Earl Oxborrow, Ely, second vice president; directors Don Moore of Reno, Carl Olfers of Lovelock, Ole Larsen of Las Vegas and Jim Childers of Fallon; and Don Tippin, Hawthorne, secretary-treasurer.

E. W. Fair

LaBrie Elected by Montana Chiefs

Chief Art LaBrie, Whitefish, was elected president of the Montana State Fire Chiefs' Association during the recent 5th annual conference in Great Falls. He succeeded Chief F. C. Foucher of Lewistown.

Other officers include: First vice president, George P. Knaff, Sidney; second vice president, Walter N. Riley, Anaconda; third vice president, William Penttila, Bozeman; fourth vice president, J. W. Lehrkind, White Sulphur Springs; fifth vice president, Ted Barteau, Shelby.

Speakers who addressed the delegates included: Loren S. Bush, president, NFPA; Jay W. Stevens, director of fire prevention, IAFC; and Emmett Cox, fire prevention training director, Western Actuarial Bureau.

W. S. Hayes

Please turn the page

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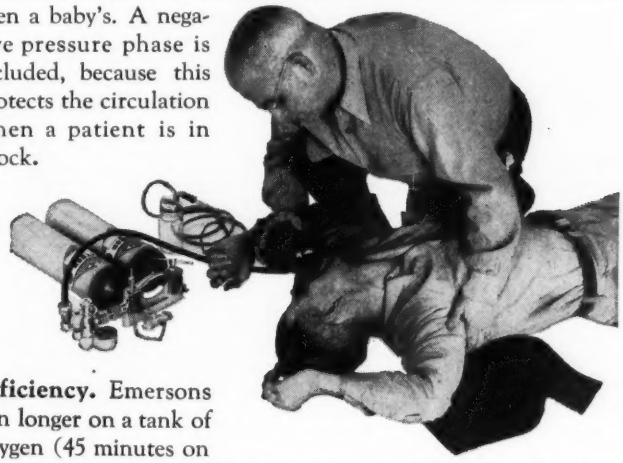
2. **Safety.** The factory-set pressures have proved effective, and are not adjustable. In over 16 years, since their acceptance by the American Medical Association, they have never harmed a lung, even a baby's. A negative pressure phase is included, because this protects the circulation when a patient is in shock.



3. **Efficiency.** Emersons run longer on a tank of oxygen (45 minutes on a "D" tank, if the mechanism is **air-mixing**). On a beach or other remote place this factor may save a life.

4. **Adaptability.** Standard models can be adapted for **dual, triple,** or **quadruple** use. Extension hoses can be used to give full protection 400 feet away from the parent machine, complete with **aspirator** as well as **resuscitator** and **inhalator** functions. Large cylinders can be hooked up, for long cases, by using a flexible connector.

5. **Quality.** Workmanship and materials are superlative, guaranteed by the factory (for two years) and checked by our representatives throughout the United States and Canada.

These advantages add up!

EMERSON RESUSCITATORS
can help you save lives!

See your Emerson representative or write:

J. H. EMERSON CO.
CAMBRIDGE 40, MASSACHUSETTS, U. S. A.

Patete Named By Colorado

Nick Patete, Louisville, has been elected president of the Colorado Firemen's Association, succeeding Mauritz Williams of Fort Morgan. During the convention in Salida, other officers elected included Vice Presidents Joseph C. Talbot of Pueblo, Willard E. Miller of Denver, Albert Merlino of Palisade, Vursch Robb of Monte Vista and Willis Demill of Englewood. Art Beck of Denver was named secretary; Roy P. Herren, Denver, historian and custodian; and Ernest E. Anderson, Englewood, treasurer. Glenwood Springs will host the 1962 convention. *E. W. Fair*

Dorman Heads New York Fire Chiefs

Chief Charles R. Dorman, assistant director of the New York State Fire Safety Division, was elected president of the New York State Association of Fire Chiefs during the recent convention at Lido Beach, N. Y. He succeeds Chief Otto E. Friske of Milan.

Officers elected to serve with him include Chief Joseph Blackburn, Eggertsville, first vice president; and Chief Ralph Whiting, Medina, second vice president. Chief Ward Bohner, Kinderhook, was reelected as secretary-treasurer.

New York City Again Selects "INVINCIBLE" Nozzles by McIntire!

On its newest Fireboat, the *Gov. Alfred E. Smith,* commissioned August 4, 1961, New York City has installed five "INVINCIBLE" nozzles—four at 2000 gpm, and one at 3000 gpm electrically motor driven by remote control from the Pilot House.

McIntire "INVINCIBLE" nozzles were selected for their effectiveness, efficiency and superlative durability . . . already proven by the fact that nine "INVINCIBLE" nozzles, installed on the New York City Fireboat *The Firefighter* in 1939, have never needed repairs or replacement parts since installation.

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Shipley Heads New Mexico Firemen

Ed Shipley, Tucumcari, was elected president of the New Mexico State Firemen's Association, during the recent convention in Raton. Other officers named were W. E. Beckley, Jal, first vice president; J. C. Sampson, Las Vegas, second vice president; and Dannie Simonds, Deming, third vice president. Tucumcari will host the 1962 convention. *E. W. Fair*

Walz Heads South Dakota

South Dakota Volunteer Firemen's Association, during its recent convention in Sturgis, re-elected Darrell Walz, Parkston, president; Francis Thill, Brookings, second vice president; Francis Pyncheon, Pierre, secretary; and George Rasmussen, Aurora, treasurer. Yankton will host the 1962 convention. *E. W. Fair*

Siken Named Arizona "Fireman of Year"

Assistant Chief Jake Siken, training supervisor of the Phoenix Fire Department, and president, Arizona State Firemen's Association, was honored at the recent 35th annual convention of the latter group as "Fireman of the Year." Chief Siken, a veteran of 31 years service, was singled out for his continued interest and personal effort in conducting the state fire school. □□

FDNY Promulgates Training Manual

The New York Fire Department recently promulgated a folder containing three manuals: Training, communications and requisitions-payrolls.

The three-volume folder is a follow-up to the revised regulations which became effective last September 1. Over the years, tips on operating methods and other material which could be classified as training information had crept into the regulations. In the recent revision all this was edited out and has been incorporated in the training manual.

The training manual consists of two chapters. The first—64 pages in length—describes 25 evolutions, well illustrated with line drawings. The second chapter—three pages long—is devoted to in-service drill and instruction periods. It gives a method for presenting such instructions and lists 50 topics. It is stressed that the manual is only the beginning of a complete training guide. The Division of Training plans to present additional chapters, from time to time, on current training procedures for inclusion in a growing manual.

The Manual of Fire Communications also contains two chapters, one on signals and related procedure; the other on radio communications.

The Manual of Requisitions and Payrolls consists of a chapter on requisitions and property accountability and one on payroll procedure.

THE MIDWEST

Continued from page 747

areas. Five stations had been built between 1951-1953 for similar reasons. All are provided with new apparatus including the tank trucks previously mentioned and all pumpers on fringe areas mount 500-gallon booster tanks.

One exception is Marion Township where the apparatus was in such condition that only equipping to city department standards was necessary. The Marion fire station is also being used as quarters for the company which covers the 7,000 acres in the tract. A new station is to be built in 1964 to replace it.

The Marion station is unique in that it provides space only for a watch desk and a single man, in addition to the pumper. Another building, about 150 feet distant, is employed as quarters for the remainder of the crew. The men must run between the buildings to answer alarms. Keeping a path shoveled between them during winter snows is an added fire protection tactic not normal to the duties of city fire fighters.

Communications

In common with all communities grappling with expansion headaches created by annexation, Columbus had to face a knotty fire department communication problem. The city fire alarm system was well over age and at first only the voice dispatching system was extended to all stations using leased lines. At the outset, the Marion station was equipped solely with radio and used exclusively for alarms until the leased lines were extended. As new fire stations are built, all are equipped with radio base stations including stand-by generators to provide power in case of commercial main failure. It is also intended to install teletype, connecting each station with fire alarm headquarters.

Bringing in new territory also demanded a great deal of attention from the communications personnel. It was found that many streets in various areas had duplicate names and renaming was necessary. House numbering followed no standard pattern and it was necessary to straighten it out. At present, the chief dispatcher works closely with the street engineering department to keep the fire department informed of new streets.

During 1960 it was decided to install a new telephone alarm system, completely replacing the telegraph system. This is not a leased system but is owned outright by the city and

Please turn the page

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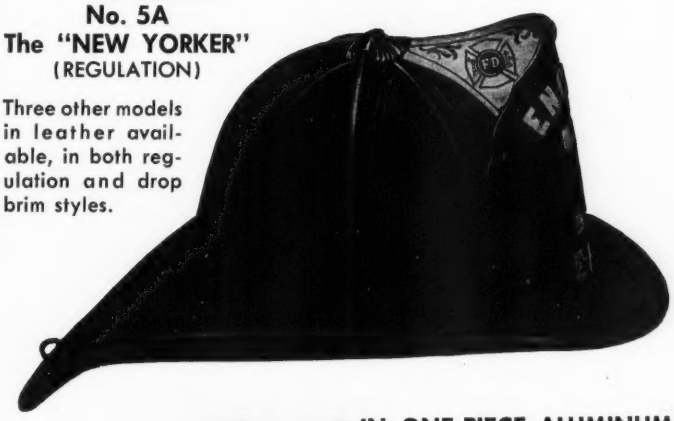
The "NEW YORKER"
(REGULATION)

Three other models in leather available, in both regulation and drop brim styles.



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Also available in aluminum, in streamlined drop brim patterns.

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The "CLIFTON"
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Other approved styles in plastic are described in our Catalog.

The manufacture of Fire Helmets has been our EXCLUSIVE business for one hundred twenty-five years. Today we are the ONLY manufacturer offering you your choice of helmets in leather, aluminum, or plastic—all of them veterans of fire service—all produced in our own modern factory—and all distinguished by those high standards of design, materials and craftsmanship for which the name CAIRNS stands throughout the fire-fighting world.

Write for Catalog 361

CAIRNS & BRO., INC. — Allwood, Clifton, N. J.

SINCE 1836

maintained by the fire department. Initially 400 street telephone boxes are being installed and the system has facilities to accommodate 600.

Airport protection

Recently the U. S. Navy relinquished its facility at the Columbus Airport which is within an annexed area. The city has taken this over and the fire department at first used Navy apparatus on a loan basis to provide protection until delivery of crash trucks could be made.

When the city assumed the responsibility for the airport it immediately sent two men to a U. S. Air Force crash school to be trained as instructors. These men train the crash crews which number 30 men, with 10 on each shift. Fire department policy is to keep airport crews intact as a special unit.

Alarms are received at the crash station via telephone and radio, plus an airport telegraph system. The latter is an integral unit of the area and it is intended to maintain it without change.

In common with the rest of Columbus, the airport is expanding rapidly in a northward direction. The city has already spent $15 million on the project and more is expected in the future. A new airport fire station is among the contemplated improvements to replace the present Navy fire station.

Grand Rapids, Mich.

Grand Rapids jumped in area from 24 square miles in 1959 to 42 square miles by the end of 1960. At the same time it increased the population from 179,000 to 197,000, the first annexations in more than 33 years. The expansion was part of an overall plan to rehabilitate and revitalize the community and the combined efforts resulted in the city gaining an "All-America City" award.

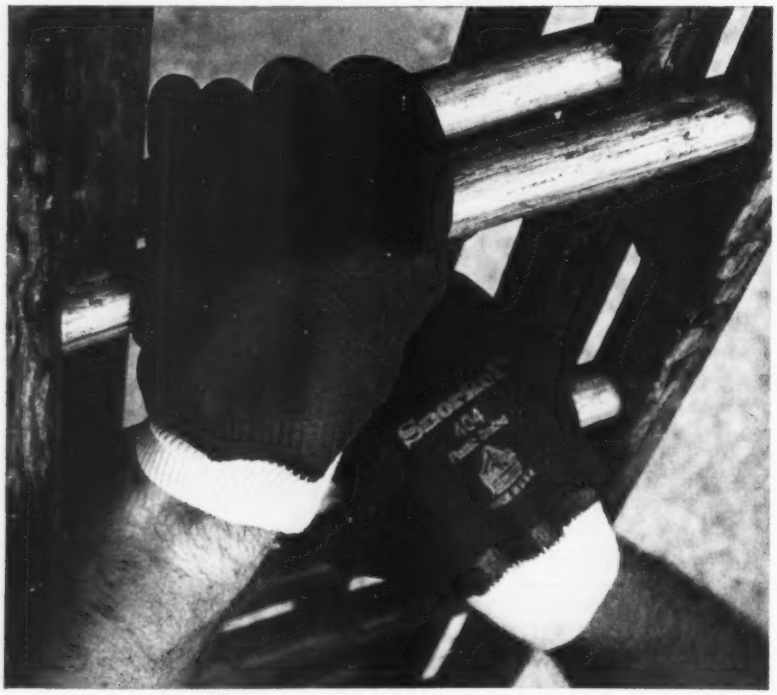
The first annexation, voted on August 2, 1960, was North Park, a residential part of the Grand Rapids Township area. It had been receiving fire protection from the township volunteer fire department headed by a paid chief. The volunteer department operated a seven-year-old 750-gpm pumper, a two-year-old 1,000-gpm pumper and a 900-gallon tank truck from two fire stations. There was no water system in the area for fire protection purposes.

On September 1, Grand Rapids assumed responsibility for fire protection, and the volunteer department, its equipment and fire stations were acquired by the city. The fire department augmented the existing equipment by placing in service a 1,500-gallon tanker at one station which now became the quarters of Engine 14. The 900-gallon tanker was quartered with new Engine 13.

Fire protection in the remainder of the town continues on a contract basis with the proceeds of the existing .6 mill fire tax accruing to the city. The township now gets the same paid department response as the annexed area, with the addition of 14 callmen, all former members of the volunteer department.

Volunteers employed

The manpower situation has some interesting aspects. The former paid chief of the township volunteer department became a lieutenant in the Grand Rapids Fire Department with slightly higher salary. He is assigned to one of the companies normally responding to the new area. All call men receive five dollars per call plus two dollars per hour on duty and four dollars for twice-monthly drills in the regular Grand Rapids training program conducted at Engine 13 quarters. They also receive medical bene-



Edmont Snorkel glove, job-fitted for firemen

A good fireman's glove must pass 7 tests. It must be:

(1) Waterproof; (2) Sure gripping, wet or dry; (3) Extremely flexible; (4) Abrasion resistant; (5) Acid, solvent and chemical resistant; (6) Easy to slip on and off, and (7) Long wearing.

Snorkel gloves, coated with tough vinyl plastic, fill all these needs. Firemen like their comfortable fit and dexterity (2-piece jersey liner won't stick to hands like rubber; wing thumb pattern with curved, preflexed fingers eliminates all seams from working areas). Budget directors like their long wear (test after test proves 40% to 70% savings in glove costs).

We'll gladly help you prove the Snorkel's worth to your department. It won't cost you anything; it could cut your glove costs 40% to 70%.

FREE TEST OFFER TO FIRE DEPARTMENTS: Write us on your letterhead. We will send Snorkel gloves (specify knitwrist or gauntlet) for comparison test. Edmont Inc., 1274 Walnut Street, Coshocton, Ohio. In Canada, write Edmont Canada Ltd., Cowansville, Quebec.

Edmont
JOB-FITTED GLOVES

fits. In addition, two captains and two lieutenants of the volunteers receive 16 hours pay every three months for maintaining the call records and other necessary administrative work connected with the force. These men now respond from the new station of Engine 15 which is better located to serve the area.

One unexpected problem was finding a new residence for the former township paid chief. As part of his original salary, he was provided an excellent apartment at Fire Station 13. When the paid department took over, he had to vacate these quarters. Engine 13 is now one of the few paid fire companies in the country which has a breakfast bar, combination living and dining room with picture window, plus three bedrooms for the crew, all air-conditioned.

A portion of Paris Township of almost 7 square miles also voted annexation in August 1960, to become effective July 1, 1961. The city fire department immediately began providing fire protection in the area in cooperation with the Paris Township Fire Department which continued to respond until the agreement was finalized. Most of the area had its own water system which will be connected to the city. To provide water in the remaining section, the fire department converted a 1,500-gallon road flusher in its shops and stationed it at Engine 4.

At about the same time North Park was annexed, a part of Walker Township voted to join the city. Due to legal difficulties encountered regarding what is property of the town and what rightfully accrues to the city, the fire department has taken over no fire equipment. Full service is given, and the volunteer fire department answers all alarms in conjunction with the paid crews while the adjustment is being worked out.

The city augmented the water supply by purchasing a road flusher which was converted to a tanker in the department shops. The water system existing in the area was a part of the Grand Rapids Water Department.

The Walker fire station is a township-owned building. It may be acquired on a temporary basis or a new one may be built. Finalization of these plans depends somewhat on construction of a new expressway which is under way at present. The station of Engine 8 will be razed as the new highway approaches, and it is planned to move this company into the annexed area.

Enlargement of Grand Rapids has provided many headaches for the fire department, but solutions have been

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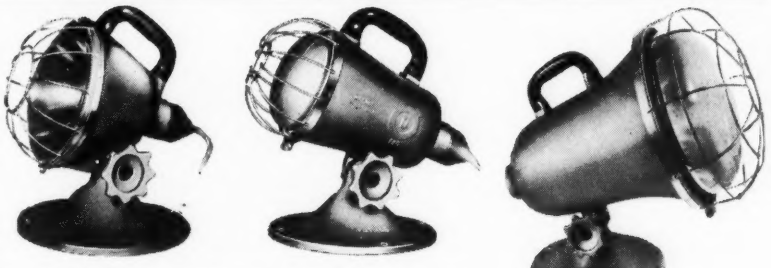
MARINE Installation

For the above marine service 163 type Circle-D's were used.

NEW 12 Volt Portables

Powerful 300 watt floods, operate off any 12 volt battery. Same rugged construction as the standard volt lights.



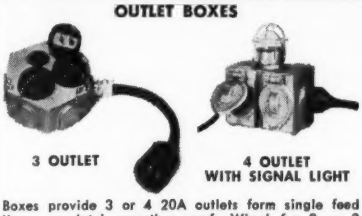
No. 163 HIGH INTENSITY
Narrow Beam Flood or Spot light PAR-56 300 Watt

No. 150 HIGH INTENSITY
Flood R-40, 200-300 or 500 watt

No. 156M 1500 Watt R-80 Flood

Standard volt portables, rugged, weather proof and corrosion resistant cast aluminum alloy, exposed hardware stainless steel, wired for 2 or 3 wire (polorized ground). Plastic handle protects against heat and cold.

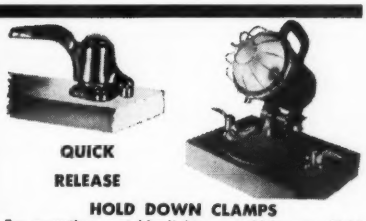
OUTLET BOXES



3 OUTLET

4 OUTLET WITH SIGNAL LIGHT

Boxes provide 3 or 4 20A outlets form single feed line, completely weather-proof. Wired for 2 or 3 wire (polorized ground) twist lock connectors.



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CIRCLE-D lamps
Heavy duty, medium or Mogul base

CORD SETS
2 or 3 wire, Twist lock connectors.

You have a lighting problem? — Contact Circle-D — We are constantly keeping pace with the ever growing demands for better lighting.

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NATALE MACHINE AND TOOL CO.
CARLSTADT, NEW JERSEY

found for most of these. Each problem solved provided guidance for the next question which arose and by the time all 14 separate annexations in the program are completed, the answers should be on hand.

New strategy required

Response to the suburban residential areas added some tactical and training problems to the fire department's operations. According to Chief Adrian J. Meyers, the first problem is how to provide water. The second is how to provide and assign apparatus for quick response and to cover those companies who are out of service answering a fire call. The fire department added 10 new men to its roster to staff the new companies and will add more in the future. Two new fire stations will have to be built and two engines and a ladder truck will be required soon, if the department is to meet its obligations to the new city residents. Incidentally, the fire stations the city did acquire from annexed areas were in excellent condition and suitable for paid-crew use. They were paid for on a proportionate basis depending on the percentage of the area and population involved.

A change in the department training program was involved. With the introduction of tank trucks, fire fighters were trained in water conservation, tanker hook-ups and tanker shuttles.

Grass and brush fire training suddenly took on a formidable prominence. Formerly such fires had been an occasional nuisance. But with annexation, the department found on occasion in the early spring that it was necessary to respond to 45 alarms in a single day. Over a three-month period, grass and brush fires averaged almost 20 per day. In addition, it was necessary to acquire apparatus to meet the off-road conditions of grass fires.

Extension of fire alarm communications to service the areas was necessary. To date, 63 telephone boxes have been added for public use while the teletype, intercom and department phones have been extended to each station. Vehicle radios on the equipment and in the stations acquired were changed to the Grand Rapids frequency.

Home inspections included

Fire prevention inspections have been extended into the new areas. Grand Rapids has had a home fire inspection program for over 30 years and 171,507 inspections were made during 1960. Upon annexation the department employed the program to advantage for cataloging all houses in the acquired areas. This provided a service to the homeowners and at the same time permitted the fire department to become familiar with the area in quick time.

The city placed the National Board of Fire Underwriters Fire Prevention Code in effect in August 1960. In common with Columbus, Ohio, it has found that gaining compliance with an existing standard is very difficult in areas where little or nothing existed in the past. □□

Chicago School-Fire Survivor Dies

Kathryn Ann Harte, 13-year-old survivor of the Our Lady of the Angels School fire and daughter of a Chicago police detective, collapsed and died of a heart attack on June 5.

Her father, Edward, was watering the lawn when the girl asked him for money to buy ice cream. Before he could hand it to her she collapsed.

Kathryn was among the first children to reach a main exit in the school fire December 1, 1958. Ninety-two children and three nuns perished in the holocaust.

E&J's new Mercury Mark I is designed, built and arranged for fast, sure action.

Its compact resuscitator, when necessary, can be snatched from the case, intact and ready to go anywhere with the operator. The aspirator, liter flow mask assembly, and other accessories can be put into service in seconds.

The exclusive Liter Flow Mask Assembly permits constant metered flow of oxygen to the patient who is still breathing but needs oxygen. This new feature is especially helpful for cardiac patients, asthmatics, etc., needing high concentrations of oxygen but not resuscitation.

The Mercury Mark I weighs only 28 pounds with a full "D" cylinder. Easily handled, it measures 7½" x 13" x 24". Ask your E & J dealer for a demonstration soon, or write for Bulletin No. 2490C, Dept. FE-61.

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Names in the news

Godfrey Promoted To Deputy Chief

Chief Instructor Thomas L. Godfrey, St. Louis, Mo., Fire Department was recently promoted to the rank of deputy

chief. Head of the St. Louis Fire Academy since 1949, he joined the department in 1935. He was promoted to captain in 1946 and to battalion chief in 1954.

G. Beaumont

Chief Carl A. Smith To Retire in October

Chief Carl A. Smith, head of the Troy, N. Y., Fire Department for the past 18 years, will retire October 1. A veteran of 43 years of service as a paid fire fighter, he joined the department in 1912 as a volunteer at the age of 16 and was appointed a regular fire fighter in 1918.

He was promoted to lieutenant in 1932 and advanced to captain in 1934. He became a battalion chief in 1935 and was named chief on December 17, 1943.

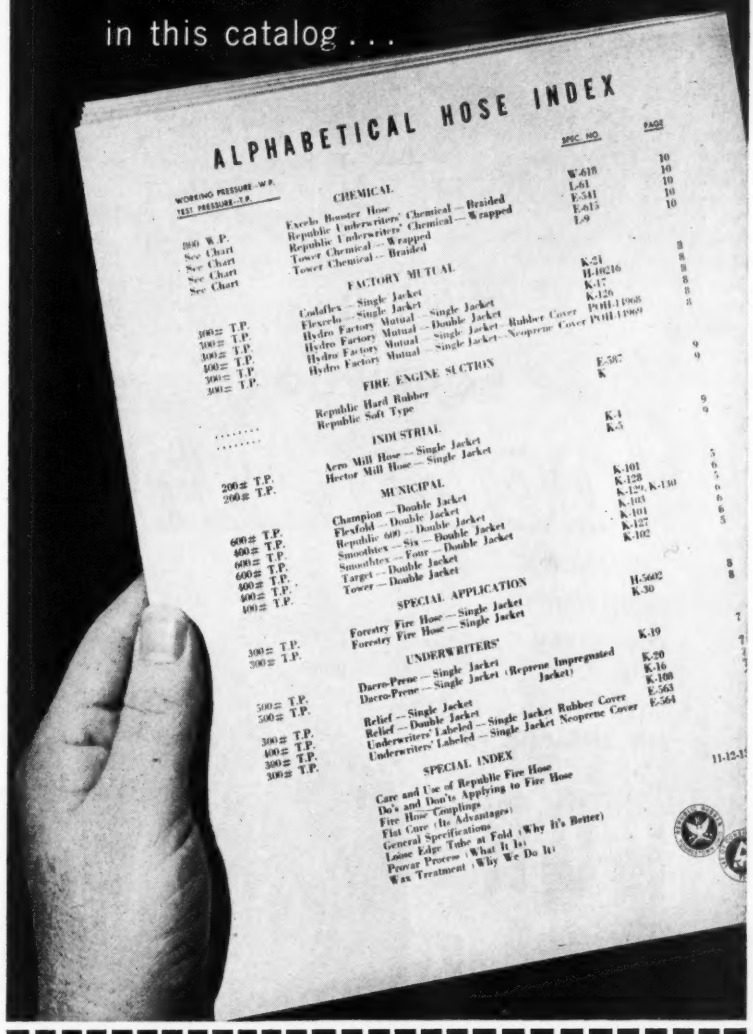
He is a member of the Eastern Division, International Association of Fire Chiefs; the New York State Association of Fire Chiefs and a member, Rensselaer County Fire Advisory Board.

J. G. Fitzgerald

Boucher Joins New York Fire Safety Division

Ruppert C. Boucher, Mechanicsville, has been appointed field representative of the New York State Division of Fire Safety for Madison, Chenango, Otsego, Herkimer, Fulton, Montgomery and Schenectady counties. He entered the fire service in 1940 as a fireman with the Mechanicsville Fire Department, where he rose to assistant captain. He had been chief of the Hemstreet Park

a wealth of useful information on REPUBLIC FIRE HOSE in this catalog . . .


ALPHABETICAL HOSE INDEX
WORKING PRESSURE - W.P.
TEST PRESSURE - T.P.
SPEC NO
PAGE
CHEMICAL
Excelo Booster Hose
Republic Underwriters' Chemical — Braided
Republic Underwriters' Chemical — Wrapped
Tower Chemical — Wrapped
Tower Chemical — Braided
FACTORY MUTUAL
Goldflex — Single Jacket
Elexelo — Single Jacket
Hydro Factory Mutual — Single Jacket
Hydro Factory Mutual — Double Jacket — Rubber Cover
Hydro Factory Mutual — Single Jacket — Neoprene Cover
FIRE ENGINE SUCTION
Republic Hard Rubber
Republic Soft Type
INDUSTRIAL
Acro Mill Hose — Single Jacket
Hector Mill Hose — Single Jacket
MUNICIPAL
Champion — Double Jacket
Flexfold — Double Jacket
Republic 600 — Double Jacket
Smoothex — Six — Double Jacket
Smoothex — Four — Double Jacket
Target — Double Jacket
Tower — Double Jacket
SPECIAL APPLICATION
Forestry Fire Hose — Single Jacket
Forestry Fire Hose — Single Jacket
UNDERWRITERS'
Dacro-Preme — Single Jacket
Dacro-Preme — Single Jacket (Reprene Impregnated Jacket)
Relief — Single Jacket
Relief — Double Jacket
Underwriters' Labeled — Single Jacket Rubber Cover
Underwriters' Labeled — Single Jacket Neoprene Cover
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Care and Use of Republic Fire Hose
Do's and Don'ts Applying to Fire Hose
Fire Hose Couplings
Flat Cure (Its Advantages)
General Specifications
Loose Edge Tube at Fold (Why It's Better)
Provar Process (What It Is)
Wax Treatment (Why We Do It)

Send for your copy today.

Contains 16 pages of information on Fire Hose in general and Republic Fire Hose in particular. Includes: Care and Use; Do's and Don'ts; Loose Edge Construction; Provar Process; Wax Treatment; Jackets, Linings, Grades.

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INDUSTRIAL RUBBER PRODUCTS

Fire Department for the past six years.

Chief Boucher is a director of the Hudson-Mohawk Firemen's Association and a member of the New York State Fire Chiefs Association.

Schultz Named to New York Fire Safety Division

Hilary F. Schultz has been appointed field representative of the New York State Division of Fire Safety for Schoharie, Greene, Delaware, Ulster, Sullivan, Orange and Rockland counties. At the time of his state appointment, he was fire marshal for the Wickwire Spencer Steel Company. He joined the Kenmore Volunteer Fire Department in 1938 and later became a lieutenant. In 1946 he was appointed a paid fire fighter in the department.

Seibold Heads Roseburg, Ore.

LeRoy Seibold, 29, has been appointed chief of the Roseburg, Ore., Fire Department. He was advanced from battalion chief to fill the post vacated by Chief Donald Starmer who resigned. Chief Seibold has been a member of the department for eight years. *Roi B. Woolley*

Pollard Resigns as Lompoc Chief

Fire Chief Ken Pollard has resigned after 16 years in the Lompoc, Calif., Fire Department. His action follows a controversy growing out of his demands for expansion of the city's fire fighting facilities. *Roi B. Woolley*

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PocketAIRE

- COMPACT
- LIGHTWEIGHT
- FOR EVERY FIRE MAN
- EASY TO PUT ON ENROUTE TO FIRE

Three models . . . full 30 minutes . . . full 20 minutes and a full 10 minutes.

Now firemen can add precious minutes to their search for trapped victims. Rockwood's lightweight PocketAIRE, the most compact self-contained breathing apparatus made, permits firemen to put in action faster and work more efficiently without hindrance by bulky equipment. PocketAIRE is small enough to fit in pocket, clamp to fire coat or be worn in a shoulder harness.

What's more, by using pure, clean oxygen, PocketAIRE supplies the most concentrated, most effective element to safeguard human breathing. Another *extra* protection feature, on all PocketAIRE units, is the safety cylinder that allows 5 minutes for escape. Cost pennies to refill and no maintenance required.

Protect every fireman in your department with economical, safe, simple to use Rockwood PocketAIRE.

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MacKinnon Named Air Services Fire Marshal

Captain Donald G. MacKinnon, Royal Canadian Engineers, has been appointed air services fire marshal, Canadian Department of Transport. Captain MacKinnon joined the City of Vancouver Fire Department in 1939. During World War II he served with the Royal Canadian Naval Fire Service, returning to the Vancouver Fire Department after the war.

In 1950 he was commissioned a second lieutenant in the Royal Canadian Engineers, and in 1951 was promoted to lieutenant and appointed to command the Fire Protection Training Troop, Royal Canadian School of Military Engineering at Chilliwack, B. C. He was promoted to captain in 1953, and in 1957 was posted to army headquarters as deputy Canadian Army fire marshal. He is a member of the Institution of Fire Engineers (UK) and was active in the founding of the British Columbia, Canada, branch.

Chief H. C. Hahn Honored

Howard C. Hahn, who retired early this year after serving 25 years as Hooversville, Pa., Borough fire chief, was made the only Life Honorary Fire Chief of the Hooversville Borough Volunteer Fire Company on May 2. Chief Hahn has also served as past president of the Somerset County Volunteer Firemen's Association. Presently, he is chief of the fire inspectors of the Hooversville Borough Bureau of Fire Prevention, president of the Cedar Springs Fire Patrol, and borough fire marshal. He is also chairman of the executive committee of the Somerset County Firemen's Association, president of the Somerset-Bedford County Firemen's Relief Association, and a deputy forest fire warden. He is owner of Hahn Fire Equipment Sales and is a member of the Hooversville Borough Council.

Putschler Named Paid Chief of Dickinson

A. F. (Tony) Putschler has been named the first full-time fire chief of Dickinson, N. D. A veteran of 33 years volunteer service, he first became a fireman in 1928 while residing in Gladstone. He moved to Dickinson in 1939

and advanced through the ranks until his election as chief in 1948. He was re-elected three times to the post. He also founded and was named chief of the Dickinson Rural Fire Department which serves an area around the city.

Chief Putschler is state vice president, Missouri Valley Division, International Association of Fire Chiefs; member of the executive board, International Fire Service Training Association; trustee and past president of the North Dakota Firemen's Association, and supervisor of the state's fire training program.

Allen Named Deputy By San Diego

Paul B. Allen has been named deputy chief of the San Diego, Calif., Fire Department. The 37-year veteran has been acting deputy chief since September 1960, following the retirement of

Official San Diego F. D. photo by McDowell

Deputy Chief Alton Penrose. The promotion places him second in command and he will divide the administrative duties of the organization with Chief Ray W. Shukraft. Supervision of the city's fire fighting forces is vested in Assistant Chiefs Orville H. Lusk and Ray T. Reilly.

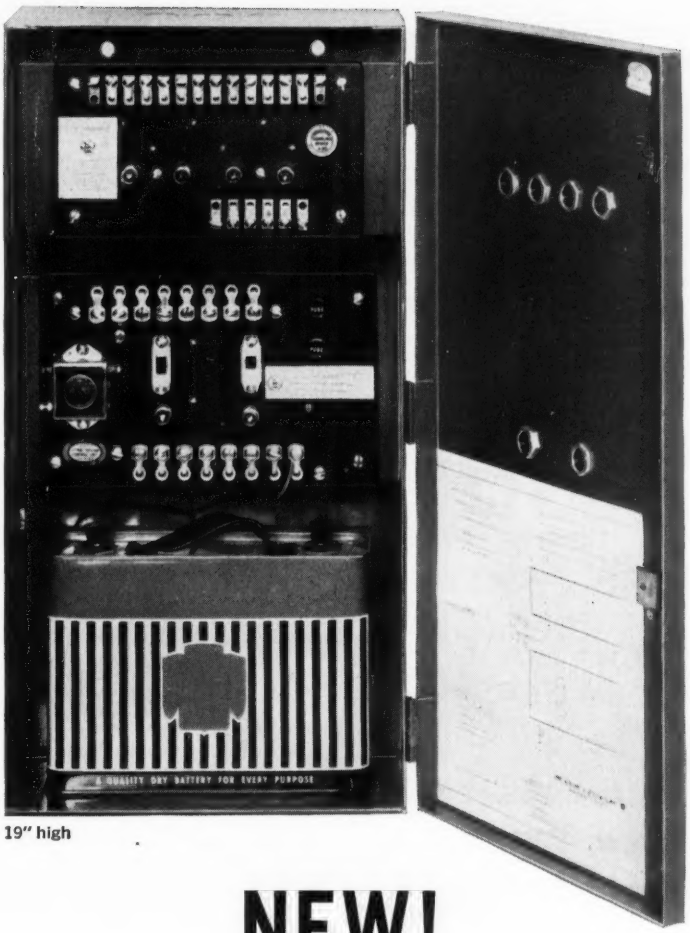
Roi B. Woolley

Vance Named Fire Marshal

Glenn B. Vance was appointed State Fire Marshal of California on December 27, by Governor Edmund G. Brown. His appointment was made following Ray Shukraft's resignation to take the position of chief of the San Diego Fire Department.

Vance, a veteran of 24 years in the fire service, spent 11 years in the South Gate Fire Department where he was in charge of the fire prevention bureau. He progressed through all the grades of deputy in the State Fire Marshal's Office and was fire prevention engineer in charge of Northern California prior to his new appointment.

A naval officer during World War II, serving mainly on hydrographic survey ships in the Pacific, he was recalled to active duty as 11th Naval District secur-



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ity officer during the Korean action. He is a graduate of U. C. L. A., with a bachelor's degree in public administration and has taken graduate work at U. S. C. and Sacramento State College.

S. H. Edmondson

Duffe Succeeds Sestric As St. Louis Director

Robert W. Duffe, former secretary to St. Louis, Mo., Mayor Raymond B. Tucker, has been named director of public safety. His duties will include administrative control of the fire department.

He succeeds Joseph P. Sestric who has been named city assessor, a post Sestric held from 1949 to 1953.

Badder Succeeds Hendrix at Tahoe

Ralph Badder, 42, of Trona, Calif., formerly of the Reno, Nev., Fire Department, has been named chief of the Tahoe Calif., Fire Department, succeeding Jim Hendrix, 67, who retired after 38 years in the fire service, the last five at Tahoe.

E. W. Fair

Gish First Paid Chief Of Imperial Beach

Assistant Chief Clarence L. Gish has been named to head the Imperial Beach, Calif., Fire Department. As the city's first paid chief he succeeds volunteer chief, W. A. Hague. Chief Gish joined the department in January 1949. He was promoted to lieutenant in July 1957 and named assistant chief in July 1959.

Chief Walter Redman Retires at Flin Flon

Chief Walter Redman, Flin Flon, Manitoba, Fire Department and immediate past president, Canadian Association of Fire Chiefs, division of the International Association of Fire Chiefs, recently retired and has taken up residence in Vernon, British Columbia. Chief Redman began his career as a fire

fighter in 1913, when he joined the Vernon Volunteer Fire Brigade. Following military service in France during World War I, he became a fire patrolman for the construction branch of the Canadian National Railroad in 1920, serving several years during the summer months. He took up residence in Flin Flon in 1937 and in 1939 was named chief of the volunteer fire brigade.

During his career as chief, the town has won seven first-place awards in Class D, and three first-place awards for Class C cities of the province in the annual NFPA fire prevention contests.

Nelson and Penley Named Auburn Deputies

Captains Howard I. Nelson and Clarence Penley, Auburn, Maine, Fire Department, were promoted to deputy chief on May 8.

Chief Nelson entered the department in 1930. He was promoted to lieutenant in 1942 and captain in 1953.

Chief Penley was appointed a fireman in 1942. He was promoted to lieutenant in 1946 and named captain in 1953.

Loughead Retires from Michigan Bureau

Robert C. Loughead, chief engineer of the Michigan Inspection Bureau, retired July 1, after 47 years of service. He entered the bureau in 1914, following graduation from the University of Michigan, and during his lengthy career was instrumental in the formation of the Michigan Fire College.

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Foster Heads Long Beach; Rizzo Named Deputy

Leonard V. Foster, 52, widely known specialist in fire prevention, was named chief of the Long Beach, Calif., Fire Department on July 25, succeeding the late Frank S. Sandeman. He joined the department on November 1, 1938, and was promoted to auto driver in April

1945. He was named captain in September 1945, fire prevention engineer in January 1950, and deputy chief in August 1960. He has attended Purdue University and the University of Southern California for specialized training courses, and is a member of the International Association of Fire Chiefs, the Southern California Conference of Fire Prevention Inspectors, and the Harbor District Firemen's Association.

Battalion Chief Tullo Rizzo, 45, was promoted to deputy chief. He is a 19-year veteran and formerly was chief of the Second Battalion.

Paul C. Ditzel

Stuerwald New Arson Assistant Manager, NBFU

John Stuerwald has been named assistant manager of the arson, theft and fraud department of the National Board of Fire Underwriters. He has been supervisor of fire investigation for the eastern and southern states since 1958. He joined the National Board in 1950 as a special agent, serving the New York City and Albany-Troy, N. Y., area until four years ago. □□

IRIC Scholarships Awarded To 16

The scholarship committee of the Inter-Regional Insurance Conference has announced awards to 16 high school students to study fire protection science at the University of Maryland. Fifteen of the scholarships are provided by eastern fire insurance rating organizations and one by the National Board of Fire Underwriters which joined the program this year. The awards grant full tuition with room and board for a four-year course leading to a Bachelor of Science degree.

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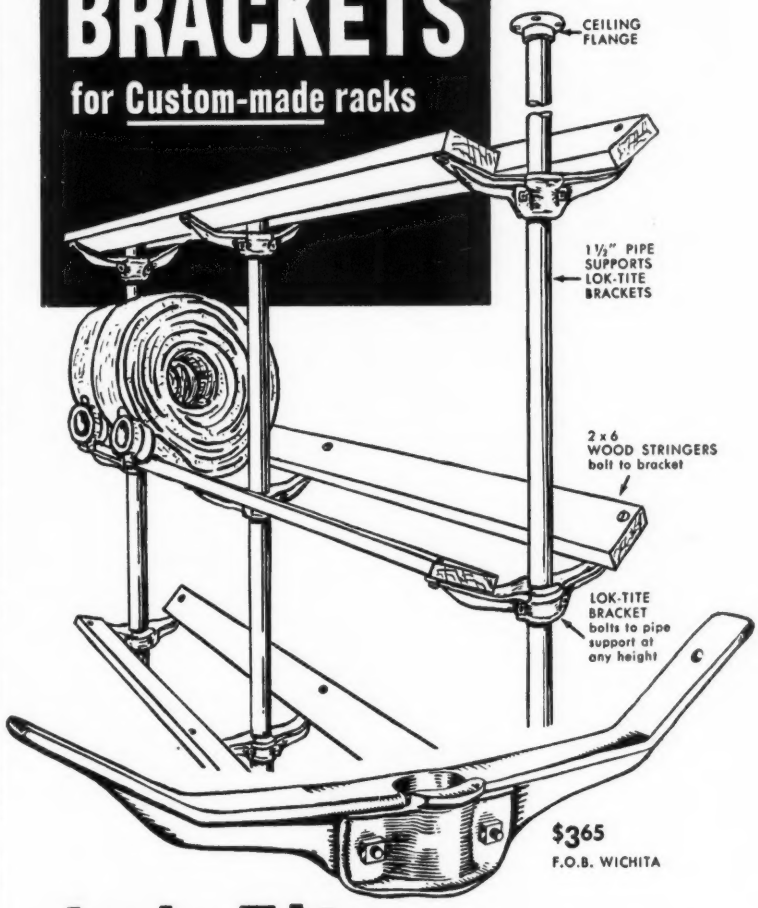
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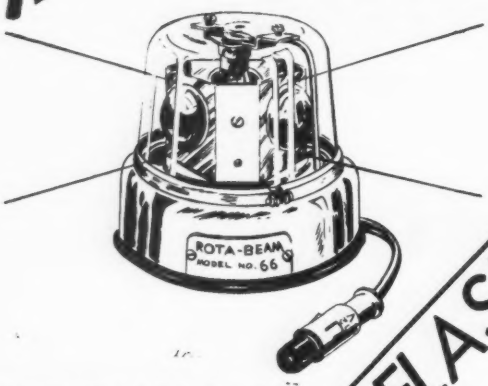

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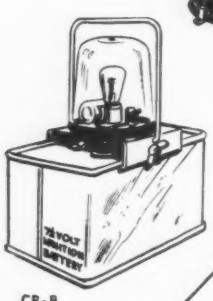

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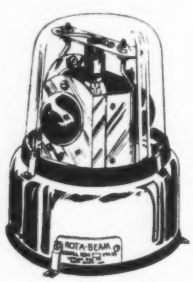

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D. C. TRAINING CENTER

Continued from page 771

construction materials, the building may be used to house fires of considerable size for training students in methods of fire attack. There are 18 thermocouples located at strategic points in the building, which are read in the thermocouple dial house. Windows in both the residential and mercantile areas are steel sash, casement, double-hung, and commercial awning and butterfly types, glazed with single-strength glass.

Thermocouple dial house

A two-story building is the control center for outside activities. On the second floor there is a multipoint recorder for the 18 thermocouples in the fire training building and a program board for determining sequence of the readings. This programing may consist of readings from all 18 points in consecutive order, or any number of points (with a minimum of two) in any order desired. Also in this location are controls for pumping oil to the basement of the fire training building or the open pits, and a control console for the communications system throughout the outside areas. The first floor of this building houses a first-aid station, drinking fountain and toilet facilities. In the basement is the fuel oil storage tank for the pits, the oil pump and a reclamation system whereby the oil and water returning from the pits are separated, with the oil returning to the storage tank and the water running into a disposal sump.

Open pit area

A 10 by 12-foot all-purpose concrete slab provides a base upon which various metals and liquids may be burned. The first open pit (7 by 11 feet) contains a domestic-type oil burner and is used to simulate small oil fires. The next open pit (11 by 11 feet) contains an electrical transformer and simulates larger oil fires with an obstruction. A "Christmas tree" enclosed in a small steel house (6 by 6 feet) 8 feet high simulates a high-pressure oil leak on fire. A tank car located in a 16 by 46-foot open pit simulates the larger-size fires. Each open pit and the Christmas tree is supplied fuel by means of an underground piping arrangement, and each has a return oil and water line to the basement of the thermocouple dial house. The largest pit, the tank car, has an oil fill valve to flood the surface of the pit, as well as simulated hand rails on the tank car which are per-

forated to allow oil to flow down over the sides of the tank car.

Drafting cisterns

A 50,000-gallon drafting cistern is located between the tower and fire training building. This and the inside cistern are constructed very much like the pumper test pits described in the National Board of Fire Underwriters Bulletin No. 277, some of the exceptions being concrete instead of wooden baffles, separate bottom drains for each compartment, and the sump located outside of the cistern for draining. The collector hood is of the "pipe" type with a holder secured in the funnel opening.

Water supply

A 75,000-gallon water tank, elevated 160 feet, supplies nine fire hydrants for use in training and for protection of the property, as well as domestic water. An 8-inch loop supplies seven of these hydrants and a 6-inch dead-end main supplies the two remaining hydrants. This provides a range of from 600 gpm to 1,750 gpm from the various hydrants. The water tank has a recovery rate of 200 gpm from the city water supply so that even a training exercise using 2,000 gpm will not affect the water supply in the area. The water mains are all valved so that a poor water supply can be simulated and all types of pumping experience can be taught to the men in training.

Communications

As may be expected with an installation of this size, some means of communication between the various areas is very important, and the system that is employed at the training center gives complete coverage. The administration building houses two large consoles which provide an intercommunication and high-powered public address voice announcement system. Within this building are remote stations from which one may contact the main desk. Through selective switching, the main console may either call all stations in the training center (inside and outside), or several particular stations, or may listen to the remote stations, thus providing two-way communications. At the drill tower and outside cistern there are microphone jacks which when used by an instructor at that location enables his voice to be heard in that particular area. In the gas mask chamber there is this same type of system, so that an instructor observing from the outside of the chamber can communicate with those inside, or can amplify his voice to other observers within the the truck and engine room. At the control center in the thermocouple dial house there is also a control console which enables the instructor observing the outside activities to amplify his voice, which can then be heard throughout the entire outside area. In the event of an emergency at the pits or outside training area, this system takes command of all speakers, thereby broadcasting only those instructions issued from the thermocouple dial house.

There are 10 extremely high fidelity loudspeakers located throughout the outside areas so that every section will receive message in full clarity. There is also an intercommunications system between the thermocouple dial house and the basement room under the mercantile side of the fire training building. In addition, there is telephone communication from the thermocouple dial house, and every classroom and office in the administration building, as well as our standard fire department "watch desk" system for communication with fire department headquarters. □□

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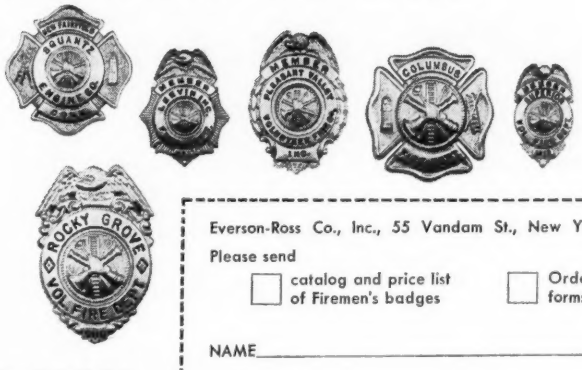

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CLARK COUNTY

Continued from page 755

Carson and Captain Robert Taylor, drillmaster. Non-fire fighting personnel include two fire prevention inspectors who spend the majority of their time checking hotels and places of public occupancy.

Chief Trelease has the responsibility for other unincorporated areas in Clark County, but the Strip and the growing residential tracts are his main problems.

"The biggest of our problems is the tremendous number of people who visit and use the facilities here, particularly on holiday week ends and during the tourist season. Thousands of people jam into the hotels, casinos and dining rooms to watch the wonderful entertainment they put on. Even under ideal circumstances there would be plenty of fire prevention and protection problems and I think that we are at least keeping up with them."

New construction generally takes many of the fire problems into consideration, but many of the hotels were built before there was any code supervision or fire department to give suggestions.

"The hotels are generally very cooperative," the chief pointed out. "For example, the Sands Hotel just did a wonderful job remodeling the hotel and installed sprinklers throughout. I understand that it cost in excess of $112,000, but the installation will pay for itself in insurance savings and increased protection to the guests."

Two of the tallest buildings in the state—the new 14-story tower of the Sahara Hotel and the eight-story Riviera are in Clark County territory. Both are Class A construction and present no major fire protection problems. Actually, most of the hotels have sprinklers in the backstage and dressing room areas, but some of the older ones do not. The chief is patiently conducting a campaign to get more sprinklers.

In 1960 the two largest fires in the history of the department occurred when the AkuAku Restaurant burned in February and the casino, shops and dining room portion of the El Rancho Hotel burned in June. The El Rancho was the Strip's first hotel and had been added on to many times, causing a number of severe fire hazards. AkuAku was a new building—but unsprinklered. El Rancho has not been rebuilt, but AkuAku has, this time with sprinklers.

The department has no training tower, but uses the old Las Vegas Race Track near the Convention Center for drills. Occasionally a building to be razed provides opportunity for a "hot drill." □□

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MODERN BADGES

Continued from page 767

badge production became factory mechanized, however, standardization inevitably increased. For far too many years thereafter, all kinds of official badges looked pretty much alike. As long as this situation prevailed, phony badge-flashers operated with considerable impunity. Today, in a rapidly increasing number of cities, the official badge is being restored to exclusiveness and authority, fully protected by copyright law.

A surprising aspect concerns the matter of cost. There is a natural tendency to associate a custom-designed article with a high price tag, and it is true that for many years personalized badges could not be produced in quantities and at prices required to meet the needs of the average fire department. Today that situation has changed completely. Many magnificent, individualized badges, frequently multicolored, actually cost less than a large number of the old stock badges.

New metal alloys and advances in

the art of enameling have contributed much to the revolution. Custom designs also present opportunities for production economies that the standard badge styles do not afford. For example, a stock badge is made up in advance with blank spaces provided for insertion of the required names and numbers. These are added by a relatively costly and highly skilled hand lettering process. Custom badges, on the contrary, have most, or all, of the required data cut directly on the dies from which the shields are struck.

Many old-time badges also sported a Victorian profusion of cut-out shapes. These require expensive piercing tools and additional complicated finishing operations. Modern badges, though exhibiting a wealth of finely sculptured detail, have generally cleaner lines and can be processed much more efficiently.

The finished artist's sketch of a badge, prepared from ideas supplied by the customer or suggested by the manufacturer, usually represents many hours of careful research. From this sketch steel dies are prepared by skilled craftsmen.

Metal badge blanks are then struck, some as many as seven successive times to obtain the sharp definition of contour and detail that distinguishes quality badges. Trimming, lettering, enameling, and assembly operations follow, and the badge is carefully polished prior to plating. This so-called "under-polishing" is of great importance in obtaining the final mirror finish that characterizes the best badges. Finally, after triple plating, the badges are cleaned, buffed, and packed for shipment.

Into this basic manufacturing process new developments are constantly being incorporated. Latest innovations include modern metals. One is an aluminum alloy that reduces badge weight by approximately two-thirds. Another is a special metal alloy that has the same golden color throughout, with no surface finish to wear off under years of wear and polishing. Both have proved particularly resistant to smoke and moisture corrosion, a factor of importance in fire badges.

Heraldic history

Fire service badges symbolize a wonderful heritage of unselfish tradition and a background of heroic deeds. A symbol is a visible sign, representing a quality or an object. For instance, the flag of the United States is not only emblematic of our country, but in addition, it symbolizes the principles on which our country is founded. None of these qualities can be pictured or photographed, so the symbol

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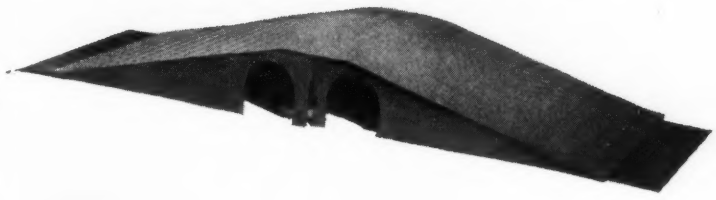

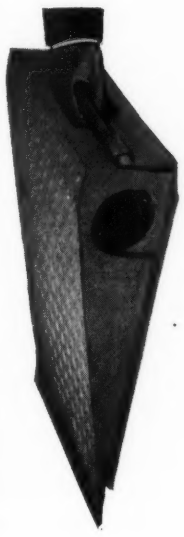

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or the emblem representing each becomes a live picture of the characteristic which is to be indicated.

The emblem of the fire service is the cross, commonly referred to as the Maltese Cross, and it symbolizes the traditions and the ideals of the fire service. The arms and the tree of that cross are of equal length which widen as they extend from a central point. The edges are usually flat, or they may be curved slightly.

Here the fire service emblem differs slightly from the true Maltese Cross, which is usually indented at the end of the tree or arms. This cross, with its wide extended arms, symbolizes the open wings of a bird, covering and protecting her young. As it was used originally, it belongs to the Christian Knights who shielded the weak. Just as it fittingly portrays the protecting power of the knights, so as a symbol of the fire service it signifies the protecting power of the men of that service.

Knights of the Crusades were men who wore the insignia of the Cross with honor to themselves, with loyalty to God and to Country, and with charity even unto their enemies. At some battles certain men would distinguish themselves by heroic deeds. In recognition, the cross worn by them was decorated with floral designs in the shape of birds, accounting for some of the deviations.

The shield worn by the knight was protective armour. History tells us that a shield upon a coat of arms implies a "defender." Thus we find the badges of the fire service in many instances in the form of a shield, containing the emblem of the cross either upon the shield or upon the crest.

Unbroken service and loyalty

Among the decorations usually found on fire badges is a rope or cord forming a border. This is unbroken, signifying unbroken service and loyalty. The crossed arms, axes and ladders in the form of the "Saltier" or St. Andrew's Cross are symbolic of resolution and a reward for such as have scaled the walls of cities, a decoration reserved for the bravest. In the fire service we find the crossed trumpets, axes, and ladders on the badges of fire chiefs and officers, signifying the rank of the service. Truck companies may have crossed axes; engine companies, crossed nozzles.

Birds are evident in emblems of the fire service, and it is usually taken for granted that it is only one kind of bird. However, there are two. The first is the phoenix, not to be confused with the eagle. You'll find it on top of fire helmets and on badges and seals.

This bird was used by the early Christians as the symbol of the resurrection of Christ. To them it also symbolized the pledge of eternal life. In modern times, the phoenix has become the symbol of a city that has been destroyed by fire and has been resurrected.

Legend has it that this bird, about the size of an eagle, lived at the time of Adam and Eve and did not eat of the forbidden fruit as all other birds did. As a reward for his loyalty, he was promised eternal life. When he sensed old age approaching, he retired to his nest of faggots and set them afire by friction from the flapping of his wings. As he is consumed in these flames, he emerges from the fire a young and beautiful bird in full plumage. The head of the phoenix is finely crested with gold. His neck has golden colored feathers, his tail is white, and the body is either purple or crimson.

The eagle is also used as a symbol, usually upon the badge of chief officers. The eagle is a king in its own domain. He lives a dignified existence,

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and doesn't meddle in ordinary affairs of bird life, but he does at times administer severe punishment with his talons and beak. He is lofty in position, majestic in flight, and dauntless in courage. The eagle is a bird admired by man.

As such, we find him represented on the shield and crest of executive officers only, those who have authority to administer discipline. He is usually displayed surmounting the shield with his wings extended, signifying that the wearer is a man of authority and good judgment. The extended wings, like the arms of the cross, signify protection and charity, and the beak and exposed talons, the enforcement of discipline.

This is the tradition upon which is formed the organization of the fire service. It is unique and unshared by any other group—as symbolized by the Maltese Cross. It is significant that throughout the world, in Europe, South America, North America and most other places, the so-called Maltese Cross is the universal insignia of the fire fighting service. This in itself gives considerable credence to the story of this sign. □□

Parade Emergency Has Happy Ending

A ride in the Memorial Day parade at New Britain, Conn., May 30, came to a fiery end for Marcia Michlowski, of that city, chosen "Miss New Britain" for 1961. A bystander threw a firecracker at a float carrying the beauty contest winner, as the parade reached the dispersal area. The float, made of crepe paper and other flammable material, quickly went up in flames.

Miss Michlowski, attired in an evening gown and panicky at her plight, jumped into the arms of a fireman, who was marching in the parade. She was slightly ruffled, but uninjured. There were no complaints from the fireman.

Tom Magner

New York Allocates FDNY Operating Budget

The New York Fire Department has been allocated $127,490,214 for its operations during fiscal 1961-62, beginning July 1. Personal services of the 12,530 authorized members of the uniformed fire force total $89,376,570. Other than services is allocated $38,113,644.

The quota for uniformed personnel includes: One chief of department, nine assistant chiefs, eight deputy assistant chiefs, 64 deputy chiefs, 255 battalion chiefs, one chief medical officer, 13 medical officers, seven chaplains, 457 captains, 1,439 lieutenants, 43 pilots, 95 marine engineers and 10,138 firemen.

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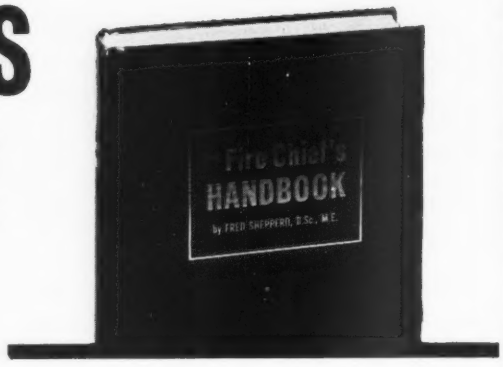

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SUPERMARKET FIRES

Continued from page 781

will effectively shatter the windows without having to expose men. Wait about 30 seconds and then move in slowly. The windows will have to be replaced, regardless, because they will be permanently discolored and damaged from the heat and smoke.

Wherever possible, it is preferable to force doors rather than break windows, This is not only because of the damage feature (in many cases it is more economical to break out the window from a door and open same from the inside). The objection is the possible severe lacerations which result from men being struck by broken plate glass.

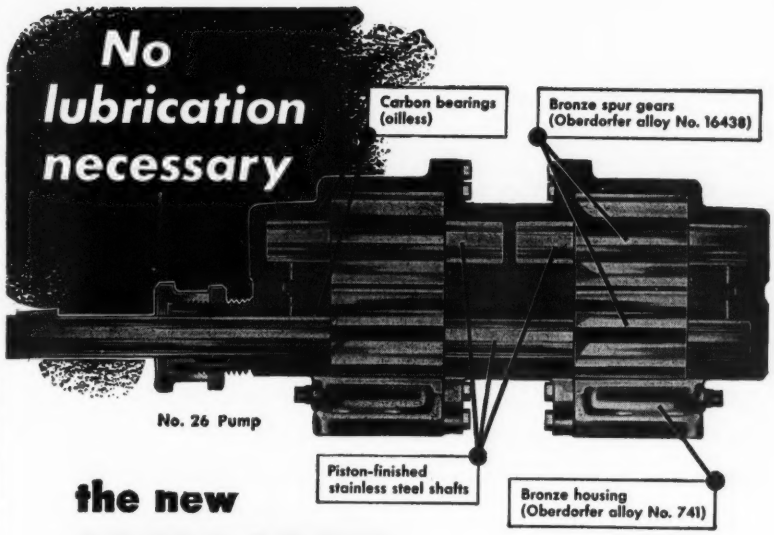
As soon as ladder companies have completed their primary functions, they move into store and begin to pull down ceiling to expose fire in cockloft, then perform the routine jobs of checking gas and electric service, examining for extension in partitions, overhauling stock, etc.

Determine whether you have enough companies on hand. This may develop into a large fire requiring eight to 10 lines if exposures are threatened. Get help early if it appears you may need it. Special equipment such as lighting trucks, rescue units, medical aid, other municipal agencies, extra police, etc., may be required and should be ordered. A command post or communications center should be established and all orders issued and assignments made through it.

Check points

Guard against:

1. Heavy signs with unprotected steel exposed to fire which threaten possible collapse on operating forces and may pull store wall down.
2. Overhead electric wiring exposed to fire and falling on forces below.
3. Sudden high winds or sudden change in wind directions causing exposure to other buildings or sudden change in direction of exposures.
4. Possible expansion of steel girder and/or beams sufficient to push out wall to point of imminent collapse of side, rear or front, dropping entire roof structure.
5. Roof collapse. Where men are sent to the roof to operate and any doubt exists as to roof stability, take these precautions: Bring up long ladders. Lay them out flat on roof and bridge the area under suspicion. Men opening the roof can work from the ladder or immediately adjacent. If roof begins to give, men on the lad-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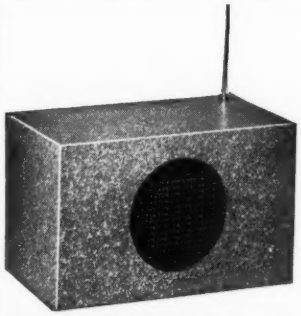
PERFORMANCE DATA—No. 26 and No. 13 PUMPS

Pump No.	Pump Shaft R.P.M.	Pounds Pressure	Hose Length and Size	Dry Suction Lift in Feet	Vol. in Gal. Per Minute
26	1600	120	500'—1½"	20'	150
13	1600	120	500'—1½"	20'	75

LIST PRICES —No. 26 — $249.50 No. 13 — $122.50

Slightly higher west of Rockies

FIRE PUMP DIVISION, Oberdorfer Foundries, Inc., Syracuse, N. Y.



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ELECTRONIC DIVISION
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17 Second Ave., Bayshore, N. Y.

der will be safe, and men adjacent to it will, in most cases, have time to move to safety.

Added safety measure

An added measure would be to attach ropes to the men which are held by members on safer portions. In case of failure, men can be hauled back to safety. Those departments equipped with elevated-platform apparatus, more familiarly known as the "Snorkel" may use this equipment to advantage at such fires.

Where strong doubt exists as to roof stability, don't send men to roof. Withdraw inside lines and order all men out of and off of building. Surround with lines and resort to outside fight. Remember roof structures with unprotected steel members have very little resistance to a hot fire. The type of roof mentioned here has a high insulating value. Fire getting into the hanging ceiling will not burn through as with the wood-sheathed roof. The heat will not dissipate but rather concentrate under the insulating sheathing. Men on the roof may have insufficient warning or lack appreciation of the amount of fire under them. Roof collapse under these conditions may be relatively sudden.

Ladder company operations

First truck company ladders roof at rear at closest point to where they will operate. Roof is opened over hot spot. They call for charged line when ready to open. Entrance to front door is forced, provided front windows are not hot to touch.

Second truck company ladders roof at front and side; forces rear doors, assists first ladder company to cut roof.

If a third ladder company is available, they are ordered to check for extension on each side into other stores. Particular attention should be paid to hanging ceiling. It may be necessary to make small holes in ceilings of adjoining stores to determine fire spread. Stores should be ventilated to remove any smoke. Lines should be called for as needed. Lighting equipment should be set up.

Sprinkler siamese connection

Where sprinkler siamese connection has been provided, make sure it is supplied by one of the first hose lines. Where a great many heads may have opened, stretch a second line to the siamese. Where sprinkler supply is from street main or yard hydrant system, make sure pumpers do not "steal" water from the sprinkler system. Stretching lines into the siamese is good insurance against poor water supply to the fused sprinkler heads.

Engine company line placement

Line 1 is stretched into store via front entrance, advancing, if possible, into rear utility area.

Line 2 backs up line 1 and advances toward rear utility area.

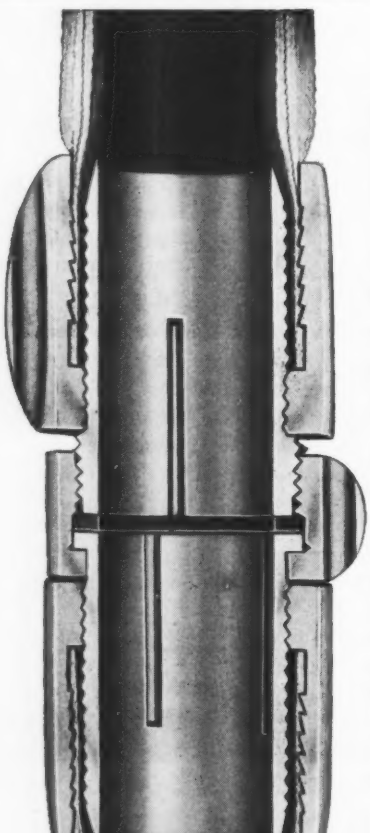
Line 3 is stretched to distributor nozzle on roof.

Line 4 is stretched to rear entrance.

Line 5 backs up line 4 if there is only one rear entrance; otherwise goes in through second rear entrance to advance on fire.

If the involved area is large enough, it may be necessary to use two distributor nozzles on the roof. Line 5 would be used for this purpose and another line stretched to take its place at the rear. If there are stores adjoining, and fire is suspected of getting into the hanging ceiling via the common party walls, then Line 4 goes to one side into exposed store and Line 5 goes to other side. These lines should be wyed off into two 1½-inch lines each. This will give greater mobility and more coverage of distance in each of the exposed stores. Then line 6 is stretched to rear door. Line 7 backs up line 6 or goes through second rear door if such exists. Line 8 is stretched to roof to cover in case fire gets up through roof despite distributor nozzles.

(To be continued)



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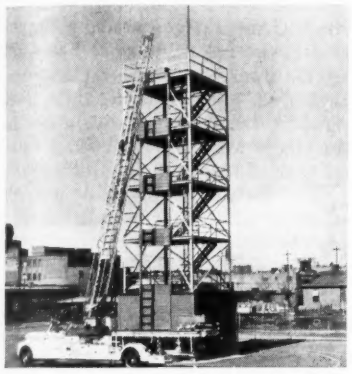
Pueblo Establishes New Training Center

The Pueblo, Colo., Fire Department, Chief George F. Lowe, Jr., has established a training center one-half block from the central fire station. The drill tower is five stories high, and has a steel frame and wood decks. There is space on all faces of the tower for apparatus to maneuver, so the firemen can work from any side.



The grounds are fenced, providing protection for the men, and preventing interference from spectators. The entire area is paved and drains to a pumping sump in one corner of the lot. By draining the grounds to the sump, the water used in drills can be re-used by drafting. As there is a water shortage in Pueblo during the summer months, this is an important factor. A fire hydrant is located in the corner of the lot near the sump. Chief Lowe hopes to have a pit for flammable liquid fire training installed in the near future.

Fire Hits Shipyard Which Builds Fireboats

A two-alarm fire raged through sections of the John H. Mathis Shipyard in North Camden, N. J., on the night of March 13-14. The fire destroyed the machine and paint shops and put out of operation the yard's underwater railway, which pulls ships from the water to drydock. Three tugboats in the yard for repairs and a fireboat under construction for the City of New York were not in danger from the flames, but delivery of the fireboat will be delayed for several months.

Deputy Chief Joseph Ballinghoff said the fire may have started in the paint shop in the front section of the machine shop, a one-story structure. Firemen brought the blaze under control in 45 minutes, but were recalled about six hours later when the flames rekindled in the southwest corner of the yard. They extinguished the new fire within 30 minutes. The firemen were hampered by a 440-volt power line which was short-circuiting and whipping through the air. The line supplies the power for the underwater railway. A licensed electrician was pressed into service to cut off the power.

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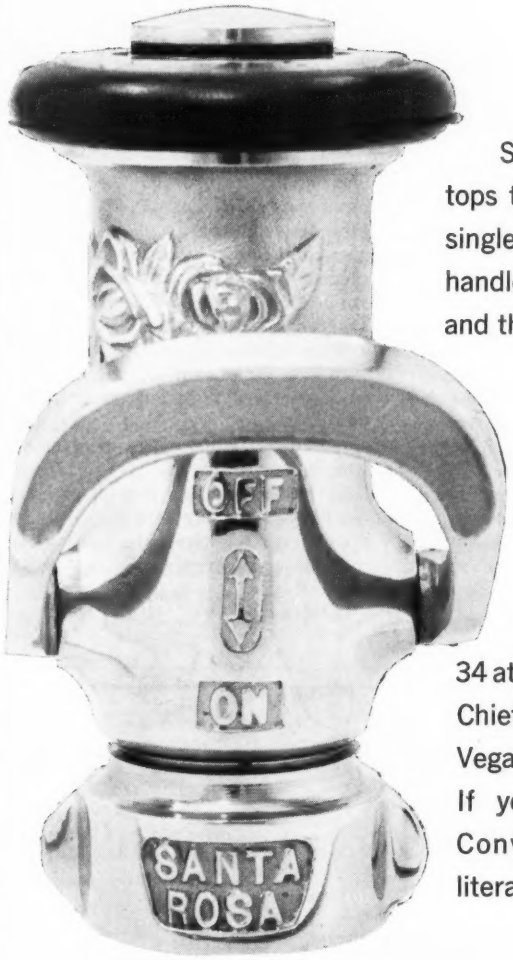

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Connecticut fire threatens town's business center

By **LIEUTENANT RAY JONES**
Eagle Hose Company

FIRE THREATENED a block in Guilford, Conn., and endangered the lives of some 42 tenants living above business occupancies, early on Sunday, June 18. Police discovered the fire, radioed the alarm, and then led the occupants to safety.

The building, a large wooden structure with a slate roof built in 1895, is some 30 feet wide and 90 feet deep. In the front it consists of two stories and a large open attic; the second floor is only 40 feet deep. The rear has but one story with a very high ceiling and an open cockloft above.

Exposures consisted of a wooden building about 10 feet south of the burning building and a brick building 15 feet north of it. Several buildings in the block, south of the fire building, are of wooden construction, and two of them are three stories high. Fortunately, there was little wind at the time.

Pre-existing plan followed

The alarm sounded at 12:45 a.m., and Guilford's three central fire companies responded. Fire Chief Elton Sheehan called in a fourth company from North Guilford. As the companies arrived, they deployed equipment and lines according to a prearranged plan. Chief Sheehan also radioed for aid from Branford and Madison because of the critical locale.

Fire fighters operated seven 2½-inch lines plus 1½-inch lines. Streams were operated from ladders and the ground at the outset, but as the fire spread through the open cockloft, they were advanced to the roofs of adjacent buildings. The roof hampered the firemen at times, and they tried to open it up but the slate was nearly red hot and heavy smoke drove the crew off.

A Branford engine supplied two lines to Guilford's deluge gun with a 500-gpm fog head. This was placed on the street side of the fire and directed into the area above the second floor. Madison's pumper supplied two hand lines in front.

Brought under control in two hours, the cockloft was gutted and collapsed during the fire fighting, and the roof on the front part of the building was destroyed. The second floor was damaged by the flames at ceiling height, and there was heat, smoke and water damage throughout the rest of the second floor. The store was also damaged by water although salvage covers protected the stock. Adjacent buildings were not damaged.

Mutual aid companies were released at 4:30 a.m., and all engines had taken up by 7 a.m. A crew from the Eagle Hose Company remained at the scene until noon to prevent rekindle.

Fire Marshal James Shaw attributed the blaze to smoking in bed. He estimated the loss at "not over $40,000." Five Guilford firemen were injured slightly. □□

Another New Champion to Imperial County Fire District* — Their Sixth DARLEY

*EL CENTRO, CALIF.

W. S. Darley & Co., Chicago 12

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THE SOUTH

Continued from page 749

housing developers desiring to provide city-supplied and serviced water systems in developments in areas to be annexed, installed mains to meet city regulations, as is required.

To meet the fire protection needs of the new area, six stations are to be provided in five years. Lots for four new stations in areas recommended by engineers of the National Board of Fire Underwriters have been purchased and construction started on the first station which will be activated in the fall of 1961. It is anticipated that four of the six new stations will be completed and in operation early in 1963, as is scheduled in a five-year capital improvement program approved and adopted by city officials. The program also includes provisions for annual extensions to the fire alarm system and installation of additional boxes. Two pieces of apparatus for the new stations will be purchased annually with funds allocated to the current operating budget and the capital improvement program, without resorting to the issuance of bonds.

The city was surrounded by volunteer fire departments, and the city department took over the districts and responsibilities of these on annexation. The Charlotte Fire Department maintains friendly relations with the volunteer departments beyond the annexed area and has worked out a mutual aid agreement with them.

Legal suits in Virginia

To meet the threats to Fairfax County, Va., territory through annexation suits by neighboring cities and towns, the board of county supervisors sought to make Fairfax County into an annexation-proof city. They attempted to do so by consolidating with the Town of Clifton to become a city under Virginia law. The procedure required a referendum, which had been set by order of the circuit court for July 11, 1961.

On June 30, 1961, the circuit court, ruling on an action brought by the Town of Herndon, ordered the referdum cancelled, stating that the statute was unclear and that the legality should be determined before a referendum is held. It is not probable that the Virginia Supreme Court of Appeals will hand down a determination of the questions involved before the next general assembly session.

Since the referendum was ruled out, county voters on July 11, the date of the Democratic primary, signed petitions to the general assembly asking that body to give the county a char-

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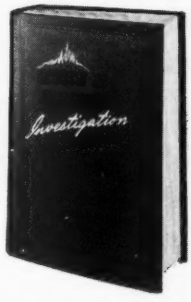

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ter like the one proposed in the consolidation agreement under which Fairfax County could consolidate with a city.

The board of county supervisors pointed out that "the problem is still with us. Although we won an annexation suit brought by Falls Church, the City of Alexandria on June 30 filed suit to annex 21 square miles of Fairfax County territory. The Falls Church case probably will be appealed. In 1950 Fairfax County won a similar Falls Church case but lost 7 square miles to Alexandria. Either can refile in five years. So can the new city of Fairfax and the towns of Vienna and Herndon. We understand both Fairfax and the Town of Occoquan on our southern boundary are considering annexation." The board pointed out that if it had lost the Falls Church case, or if it were to lose the Alexandria case, county taxes would have to be raised to make up the lost revenue.

James C. Fahey, editor and publisher of *The Ships and Aircraft of the U. S. Fleet* and *U.S.A.F. Aircraft*, a subscriber to FIRE ENGINEERING for many years and a resident of Fairfax County, told FIRE ENGINEERING that "all the neighbors are dead against being swept into the City of Falls Church." Their principal objection is the conviction that their taxes would rise considerably. □□

NAVAL CRASH TECHNIQUES

Continued from page 788

is similar to other dry chemical powders in physical characteristics such as particle size and resistance to packing and caking. This new agent is said to extinguish twice as large an area of fire per pound as sodium bicarbonate powder. The powder is tinted purple to distinguish it from "C-D-C" (yellow-green) powder and other noncompatible powders which are colored white or light blue.

The Bureau of Naval Weapons reports that when "Purple-K" is used on fuel fires such as aviation gas, the fire fighter experiences instant control of the flames without sudden flare-up which usually occurs with the use of sodium bicarbonate dry chemical. This agent also holds the fire from reflash longer than does "C-D-C" powder. This assists the fire fighter to advance toward the flames and makes the application of the foam blanket less difficult.

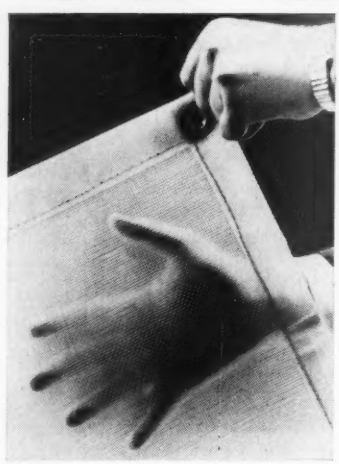
The new powder is used in standard types of dry chemical extinguishers, painted with a purple band around the top to designate its contents. In addition to extinguishing flammable liquids of all types, "Purple K" may be used to put out tire fires, burning hydraulic fluid and wheel lubricants. The dry chemical puts out the fire without sudden cooling which could warp the metal wheels.

The Bureau of Naval Weapons directs that "Purple K" should be applied very close to the fires with the powder discharge parallel to the ground. Short bursts of dry chemical, applied in a side-to-side motion are effective in preventing reignition of the flame while the wheel cools slowly. Very little nozzle velocity is required.

The Bureau of Naval Weapons has determined that "Purple K" will not destroy foam blankets and it can be used for finger fires in or around a foam covering applied by the MB series of aircraft fire fighting trucks.

Another development which may have important implication for civilian aviation is a dry chemical extinguisher suitable for air-lifting by helicopter. Already 115 of these units are in ac-

INCREDIBLY STRONG!



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tion on Naval and Marine air facilities. Weighing less than 800 pounds and capable of transporting 400 pounds of foam-compatible dry chemical, this unit satisfies a long need for a more efficient means of reaching and rescuing personnel from aircraft involved in off-base crashes and fires.

The unit is carried on the bed of a pick-up truck usually used by the base fire chief. If needed off-base, it is easily lifted from the truck and carried to the scene by helicopter.

Actual use of the airlift unit has shown that when hovering at low altitude, slightly upwind of the burning aircraft, the helicopter drastically reduces the flame height by means of the downwash of its rotors. When low-level passes were made over the fire or when the helicopter hovered over the fires, the flames were agitated adversely. It was also found that the susceptibility of dry chemical to flashback was minimized by properly directed downwash. Furthermore, rescue may be made by men in conventional firemen's clothing while the flames are controlled by the helicopter downwash even if no other extinguishing agent is available.

Two trained men are required to handle the fire fighting and rescue operations, but a third man is desirable if the capacity of the helicopter permits. It was found that rotor downwash has a distracting and disconcerting effect on fire fighters working beneath it, and it became essential to indoctrinate the men by exposing them to downwash in drill fires prior to actual fire fighting.

Wheeled dry chemical unit

Among recent additions to this bureau's fire fighting equipment are more than 300 dry chemical wheeled units of 150-pound capacity. The weight when fully charged is 425 pounds. Using hand maintenance tools, the extinguisher can be charged with dry chemical and otherwise made ready for operation in a few minutes time. This equipment is designed to be towed by military vehicles, and units are now guarding refueling operations on Bureau of Naval Weapons air activities. The extinguishing agent employed is "Purple-K-Powder."

All-purpose dry chemical

A dry chemical powder which can be used on all types of fires and still remain compatible with foam is being developed at the Naval Research Laboratory. When this powder has been perfected, it will eliminate the need for the several types of fire extinguishers now being carried on each crash fire and rescue truck. □□

SAFEGUARDING SCHOOLS

Continued from page 778

A third series of tests consisted of 30 fires set to study the performance of automatic sprinklers. Twenty-six of these fires were large enough to actuate the system. The sprinklers put out the fires before "untenable conditions" developed.

Of interest in this series of sprinkler tests was a fire set to simulate a smoldering blaze, "with low temperature development" in order to determine the time necessary to produce untenable smoke conditions in corridors and stairways. The fire consisted of burning oil rags and oil filters in a metal barrel located to facilitate smoke-spread up an open stairway. The barrel was shielded with sheet metal to prevent extinguishment in the event the sprinklers operated.

"Untenable smoke existed in the third-floor corridor at 16 minutes, 30 seconds, and in the second-floor in 24 minutes. The automatic sprinklers operated in 25 minutes and 30 seconds. It should be pointed out that although this fire produced untenable smoke conditions in 16 minutes and 30

Continued on page 883

IN THE WEST IT'S

CROWN Firecoach®

The "Royalty" of Fire Apparatus

L.A. CITY—with a fleet of 66 *Firecoach* units—proves the established preference in the West for the modern *LEADER* in fire apparatus.

The FIRECOACH, originator of many of today's progressive innovations including ADJUSTABLE SUSPENSION, Z-TYPE FRAME, and LARGER BRAKES, continues to provide advanced engineering concepts and manufacturing techniques to remain the outstanding performer in the fire apparatus field.

Available in a complete line of models, the Crown FIRECOACH is engineered in capacity and design to your individual requirements. Investigate CROWN before you write your next specifications — *you may be missing something!* CROWN is also West Coast distributor for the famous PITMAN SNORKEL. We invite you to visit our display at the convention . . . take a look at the ROYALTY of fire apparatus and see the CROWN-PITMAN combination in action.

CROWN Firecoach DIVISION OF CROWN COACH CORPORATION

2500 East Twelfth Street, Los Angeles 21 • MAdison 7-4021

Northern Representative

ANDY JOHNSON COMPANY 9900 Lexington S.W., Tacoma 99, Wash., JUniper 8-0535

Fire colleges

Arizona State Fire Training School—Oct. 19-21, Phoenix College, Phoenix. Sponsored jointly by State Department of Vocational Education, Phoenix College, Phoenix Fire Department and the Arizona Firemen's Association. For information write Assistant Chief Jake Siken, Director, c/o Phoenix Fire Department, 49 South 1st Street, Phoenix 4, Ariz.

Florida State Fire College—Sept. 4-8, **Units 101,** Tools, Forcible Entry, Breathing Apparatus, Extinguishers; **107,** Arson Detection; **201,** Instructor Training. Sept. 11-15, **Units 102,** Hose and Ladders; **109,** Rescue; **202,** Company Officer Training. Sept. 18-22, **Units 108,** Ventilation, Salvage and Overhaul; **109,** Rescue; **204,** Fire Fighting Tactics. Sept. 25-29, **Units 105,** Fire Apparatus and Pumps; **106,** Fire Inspection; **208A,** Fire Department Administration. Oct. 2-6, **Units 104,** Fire Streams; **105,** Fire Apparatus and Pumps; **206,** Fire Prevention and Fire Protection; **208B,** Fire Department Administration. All courses but the Arson Investigation Seminar will be held at the Fire College in Ocala. For information write W. H. Barnett, Superintendent, P. O. Box 785, Ocala.

Guilford County Short Course for Firemen—Sept. 18-22, Jamestown, N. C. For information, write R. W. Grant, Guilford County Fire Marshal, P. O. Box 309, Jamestown, N. C.

Indiana Fire Service Training Program—Sept. 13-16, **Indiana State Fire School;** Oct. 30-Nov. 3, **Fire Inspectors Course.** All courses to be held at Purdue University, Lafayette, Ind. For information write, Professor Shelby Gallien, Director, Public Safety Institute, Division of Adult Education, Purdue University, Lafayette, Ind.

Maryland Fire Training Program—Sept. 5-8, 28th Annual Short Course for Firemen. All courses will be held at the University of Maryland. For information, write Robert C. Byrus, Director, Fire Service Extension, College of Engineering, Glenn L. Martin Institute of Technology, University of Maryland, College Park.

Massachusetts Drill Instructors Conference—Oct. 21-22, Hyannis, Mass. For information, write Leighton F. Peck, Chief of Fire Department, 399 Main Street, Falmouth.

Michigan Fire Inspectors Conference—Sept. 12-15. Twelfth Annual Meeting will be held at the Michigan State University Kellogg Center, East Lansing, Mich. Contact, Fire Inspector John Bunk, Secretary, Michigan Fire Inspctors Society, 33110 Five Mile Road, Livonia, Mich.

Michigan Fire Training Program—Sept. 18-22, Oct. 16-20, **Basic Firemanship Training;** Sept. 25-29, **Fire Department Officer Training.** All courses to be held at the Civil Defense and Disaster Training Center, University of Michigan. For further information, write, Francis Hartman, Supervisor, Firemanship Training Program, The Civil Defense and Disaster Training Center, University of Michigan, North Campus, Ann Arbor, Mich.

Minnesota Lake Region Fire School—September 10, Melrose, Minn. For information, write Father William J. Wey, President, Lake Region Firemen's Association, Tintah, Minn., or Jim Leicher, Fire School Coordinator, Luverne, Minn.

Morris County Fire School—Sept. 5—Smoke Masks, Burham Park, Morristown Fire Department; Oct. 3—Fire Prevention, Madison Fire Department; Nov. 7—Ventilation, Florham Park Fire Department; Dec. 5—Panel Discussion, Denville Fire Department. For information, write Robert H. Wright, Publicity Chairman, Long Hill Lane, Chatham, N. J.

New Jersey State Fire College—Sept. 8-10, Sept. 22-24, **Training Course for Fire Fighters.** Nov. 17-19—**Fire Officers' Training Course.** All sessions to be held at the National Guard Training Center, Sea Girt, N. J. For information, write Robert L. Tarbox, Director, Industrial and Fire Division, New Jersey State Safety Council, 24 Branford Place, Newark 2, N. J.

North Carolina Pump School — Oct. 16-18, Charlotte, N. C. For information, write Chief Charles L. Burkett, Fire Department Headquarters, Salisbury, N. C.

Ohio State Fire School—Sept. 11-15, Ohio State University, Columbus. For information write Trade & Industrial Education Services, 1885 Neil Avenue, 118 Townshend Hall, The Ohio State University, Columbus 10.

Ontario Fire Training Program—Sept. 11-15, Radiological Monitoring Course; Sept. 18-22, Volunteer Fire Officers' Course, Part I; Sept. 25-Oct. 6, Pump Course; Oct. 16-20, Basic Fire Inspection Practices Course; Oct. 23-27, Mutual Fire Aid Forum. All of the above courses will be held at the Ontario Fire College, Gravenhurst, Ont. Regional fire schools will be held Oct. 16-20 in Essex for the County of Essex; and Oct. 23-27 in Chatham for the County of Kent. For information, write M. S. Hurst, Ontario Fire Marshal, 204 Richmond Street West, Toronto 1.

Peacetime Radiation Fire Instructors School. Nov. 27-Dec. 1 at Richmond, Va. This school is for approved fire instructors only. For information, write R. Lawrence Oliver, State Department of Education, Trade and Industrial Service, P. O. Box 657, Harrisonburg, Va.

Pennsylvania State Firemen's Training School—Sept. 11-15, Oct. 30-Nov. 1, **Basic Fire Fighting.** Aug. 21-25, Sept. 18-22, **Ladders, Rescue, Salvage.** Aug. 28-Sept. 1, Sept. 25-29, Nov. 13-17, **Advanced Fire Fighting.**

Autocall®
SECURITY SYSTEM
gives new AUTO PLANT
advanced protection features

Ford Motor Company's modern Chicago Stamping Plant is typical of industry's trend to Autocall's advanced plant protection. Here security personnel in the control center keep their fingers on the pulse of the entire plant, maintain maximum security around the clock.

This trend-setting Autocall system includes automatic sensing devices which detect dangerous or irregular conditions and instantly transmit them into the control center. Here they are immediately printed (in plain English) on the Autocall-Howe print recorder, giving cause, location and time of the signal. All signals are positive, non-interfering and successive. If two or more signals are actuated at the same time, each operates in turn and none are lost. In addition the system provides patrol monitoring and two-way communication throughout the entire plant.

An efficient, cost-saving Autocall fire alarm or complete security system can be tailored to fit the requirements of your property. Get the full story. Write, wire or phone now!

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FIRST IN PROPERTY PROTECTION

THE AUTOCALL COMPANY • SHELBY 6, OHIO • SALES OFFICES IN PRINCIPAL CITIES

Aug. 14-18, Oct. 16-20, **Fire Department Pumps (Basic).** Aug. 14-18, Oct. 23-27, **Fire Department Pumps (Advanced).** Aug. 26, Nov. 25, **Week-End Special.** Aug. 14-18, **State Fire School.** Aug. 21-23, **D2 Finisher Course.** All sessions will be held at Training School in Lewistown. For information, write Art Espey, Director, P. O. Box 631, Lewistown.

South Carolina Fire Fighter Training Service. Regional schools to be held as follows: Sept. 4-8, West Columbia; Sept. 8, Columbia; Sept. 18-22, Sumter; Sept. 25-29, Camden; Oct. 2-6, Williamston; Oct. 9-13, Chester; Oct. 16-20, Hemingway; Oct. 23-27, Moncks Corner; Oct. 30-Nov. 3, North Augusta; Nov. 6-10, Mauldin; Nov. 13-17, Calhoun Falls; Nov. 20-24, Jackson; Nov. 27-Dec. 1, Hill Top, Spartanburg; Dec. 11-15, Metropolitan Sub. District B. For information, write H. B. Wells, Instructor, Route 1, Box 119, Prosperity, S. C.

Southern Wisconsin & Northern Illinois Fire School—September 10, Green County Fair Grounds, Monroe, Wis. For information, write Herman Pfund, New Glarus, Wis.

Southwestern Arson Investigation Institute—Oct. 17-21, Extension Study Center, North Campus, The University of Oklahoma, Norman. For information write James Robinson, Coordinator and Legal Consultant, Southwest Center for Law Enforcement Education, Extension Department of School and Community Services, The University of Oklahoma.

Suffolk County Field Conference—Sept. 24, Firemanic Training Grounds, Yaphank, L. I., N. Y. For further information, contact Chief Harold Hochheiser, Secretary, Fire Chiefs' Council of Suffolk County, 146 Ostrander Avenue, Riverhead, L. I., N. Y.

Rhode Island Firefighters Instructors Association—October 13-15 at Newport, R. I. For details contact, Capt. Michael J. Fox, State Supervisor of Firemen Training, 903 Broadway, East Providence, R. I.

University of Miami Fire Investigation and Subrogation Seminar—Nov. 27-Dec. 1 at the Carillon Hotel, Miami Beach, Fla. For information write Dr. Dan Steinhoff, Jr., Dean, Adult Education, University of Miami, Coral Gables, Fla. □□

Former Fire Official Jailed for Arson

Chief Justice Richard B. Austin of the Cook County, Ill., Criminal Court sentenced David J. Rennie, 24, of suburban Rosemont to one to six years in prison for setting two fires in Rosemont that caused $175,000 damage.

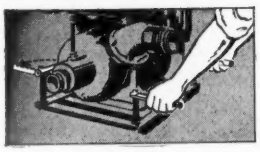
Rennie, former president of the North Leyden Township Fire Protection District, stated that his career as an arsonist began at the age of 11 when he set a fire in a Chicago business firm.

He was arrested last month by F. B. I. agents for the theft of office equipment from O'Hare International Airport and, while in custody, confessed setting the blazes.

The blazes occurred last November 1 in the Fernstrom Van & Storage Company which caused $125,000 damage, and June 23, 1960, in the River Road Elementary School which caused $50,000 loss.

When sentencing Rennie, Justice Austin commented: "Citizens of Cook County have a right to be relieved that this man is not running around with a torch."

Jeff Schwartz



TRULY PORTABLE. All models come equipped with carrying handles for two-man carry. Weight varies from 160 to 166 lbs. Picture shows handles in carrying position.

Fast action is urgent, when fire strikes. And when the water source is hard to reach, there's nothing more useful to carry on your truck than a Gorman-Rupp Dual Fire Fighter.

In a bare half-minute, water starts flowing through the lines. It can supply water to the truck pumper sufficient to operate two ½-inch nozzles at 100 pounds, or pump directly to the fire.

Gorman-Rupp Fire Fighter Pumps are backed by a positive plain-language guarantee. Ask your distributor for Bulletin or write direct.

Model 61½A-23FB	50 GPM @ 110 lbs.
Model 6201 FF	100 GPM @ 80 lbs.
Model 6301 FF	210 GPM @ 40 lbs.

The Gorman-Rupp Company
305 BOWMAN ST. • MANSFIELD, OHIO
Gorman-Rupp of Canada, Ltd., St. Thomas, Ontario

Send for SALE
CATALOG S46
just issued
Quality Fire Fighting Equipment

HALPRIN SUPPLY Co
1355 South Flower Street, Los Angeles 15, California

COMMUNITY GROWTH PROBLEMS

Continued from page 745

Apparatus

Standard 750-gpm pumpers provided with 200-gallon water tanks are well suited to built-up annexed areas having a public water system. In areas of wide hydrant spacing, it will be advantageous to increase the complement of 2½-inch hose from 1,200 feet to 1,500 feet. In areas which have no public system, the fire department will have to depend on the water it carries on the apparatus or that which can be drafted from streams, ponds or special reservoirs.

Water tanks of more than 500-gallon capacity are not generally recommended for pumpers, but rural service pumpers with tanks up to 1,000 gallons capacity may be used. The use of tank trucks, in addition, should be considered if it is desired to carry more than 1,000 gallons of water.

Ladder equipment in new areas will depend upon the heights of buildings. If buildings three stories or more exist, consideration should be given to a ladder company. The number of such buildings, size, and relative locations are all factors in the final decision. Buildings four stories or more in height require consideration of an aerial ladder.

In those areas where buildings are mainly one and two-story dwellings, the ladders normally carried on pumpers, supplemented by a 35-foot extension ladder, will usually be sufficient. Certain basic equipment normal to ladder trucks should then be carried on the pumpers.

After companies have been established or relocated, consideration must be given to necessary changes in operations. Response should be comparable to that for similar sections within the old city limits. At least two engine companies should respond with such ladder service as may be needed. If industrial plants, shopping centers, schools, hospitals, or other institutions exist, response should be increased accordingly.

Determine special problems

As soon as possible, the fire department should determine special fire protection problems. Inspections by companies of the industrial, business, school, hospital, and other important buildings will provide the intimate knowledge required for intelligent fire fighting. Any special hazards should be noted as well as the private protection available in the form of automatic sprinklers, standpipe systems, or yard hydrants.

It is particularly important that the private fire protection facilities be used wisely in outlying areas where the water supply may be weak. In responding to sprinklered buildings, one of the first engine companies arriving should immediately lay two lines to the fire department connection. If there are areas without public water supply requiring drafting operations, practice drills should be conducted at the water sources. Relay operations should be included in these drills because it may be necessary to pump water several thousand feet.

Communications

The municipal fire alarm system should be extended as soon as possible. Fire alarm boxes should be provided first at schools, hospitals and other institutions, as well as in the industrial, business, and other important areas. After this has been accomplished, consideration should be given to residential areas.

Prior to the annexation date, residents should be advised as to the method of reporting a fire both by fire alarm box and by telephone. It is im-

For extra seconds before fires spread...

Crown depends upon Garrison POWER STEERING!

L.A. City Engine Co. No. 27

With its extremely short turning radius, this Crown fire engine becomes even more maneuverable with Garrison Power Steering—now offered on all Crown fire engines and most Crown Coaches. Hydraulic power performs 80% of the steering effort, yet the driver retains steering "feel"; gains extra control and gets to fires quicker in crowded city traffic!

Garrison Power Steering is available for many other makes of fire fighting apparatus as well as most trucks, wheeled tractors, off-highway construction equipment and material handling equipment.

For proven, dependable power steering specify Garrison. Available factory installed or in kits for addition to existing equipment. Ask Garrison how your wheeled vehicles can be made safer, easier to steer and capable of hauling heavy payloads with greatly reduced effort and fatigue.

GARRISON Manufacturing Co. Inc

4609 East Sheila St., Los Angeles 22, California

portant that this information be repeatedly distributed throughout the annexed areas, using newspapers, television, radio, and other means available. Alarms for the entire city should be reported to one location.

If new fire stations are built, alarm circuits for dispatching companies should be extended. Maps and records must be brought up to date and it will be necessary for alarm operators to become familiar with the new areas, particularly the street names. Some departments make studies of all areas and prepare indexed street guides or special maps for the use of alarm operators in identifying locations from which telephone alarms may be received.

Codes

The fire prevention code of the city will become effective in the new areas on the annexation date. Unless a similar code previously existed, it is possible that numerous violations may be found. The legal status of these violations will, of course, depend upon the provisions of the local code, but it is important for the fire prevention bureau to have a record of these violations so that a true picture of conditions will be available. Even if it is not possible to legally require the removal of certain hazards, the danger of permitting them to exist can be pointed out to the building owners in an effort to obtain a voluntary elimination. If annexed areas are large, with numerous industrial, business and warehouse areas, additional fire prevention inspectors may be needed. If the existing code is not sufficiently comprehensive or up to date, adoption of a modern code should be considered.

The building code will likewise become effective in the new area on the annexation date. Undoubtedly there will be numerous buildings in the area not in compliance. Since building codes are not generally retroactive, these conditions are likely to exist for some time. This could have the effect of making fire fighting more difficult and more hazardous in some of the older buildings. With a large amount of new construction facing the city, it may be in order to review the existing code to determine if it still meets the needs. There have been so many changes in the construction field in recent years that a modern building code is an absolute necessity for a progressive municipality.

Sound planning well in advance of the annexation date is the key to providing good fire protection in new additions to municipalities. If advice or assistance is needed with respect to fire station locations, the National Board of Fire Underwriters is available for consultation with the larger cities, and the rating boards and bureaus will help smaller communities. Most of the difficulties that arise in providing fire protection in annexed areas result from haphazard attempts, usually started too late. If a plan is developed well in advance, giving consideration to the features previously discussed, new areas will not only have better protection, but will also be able to enjoy it at a much earlier date. □□

Insurance Rates for N. Y. Volunteers Rise

A 13 per cent increase in rates for insurance covering New York State volunteer firemen injured in the course of duty has been announced. The insurance, carried by cities, towns, villages and fire districts, provides up to $50 weekly accident compensation as well as death benefits.

The new rates chiefly affect 23 counties of the state and approximately 80,000 volunteer firemen. Self-insurance plans cover the remaining 34 counties outside the City of New York which have over 40,000 volunteer firemen.

APPROVED by Underwriters' Laboratories, Inc. and the Associated Factory Mutual Fire Insurance Companies.

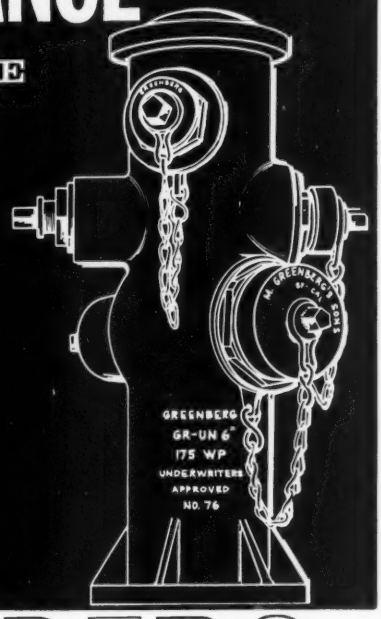
PERFORMANCE

CALIFORNIA TYPE

The most widely preferred design in use throughout temperate climates.

Specifications:

- Independent valve for each outlet. Permits the addition of extra lines without shutting off those already in operation.
- Fast Breaking Valve Design. Seat angle provides maximum efficiency, minimum resistance, quick opening and full flow of water. Eliminates water hammer and valve chatter at full 200 lbs. working pressure.
- Full 6¼" waterway.
- Simple construction. All bronze working parts and heavy cast iron body give long, trouble-free service.



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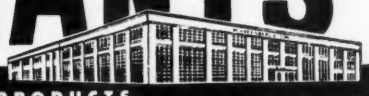

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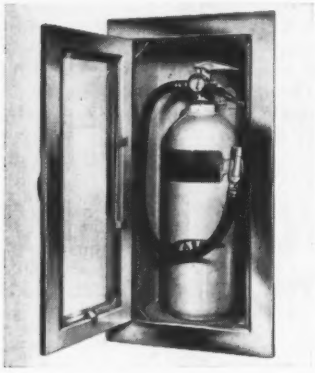
Offices in Principal Cities throughout the United States

MANUFACTURER'S NEWS

Continued from page 809



All-Purpose Extinguisher

The Fyr-Fyter Co., 221 Crane Street, Dayton 1, Ohio, is marketing its All-Purpose dry chemical fire extinguisher which is approved by Underwriters and Factory Mutual Laboratories for all types of fires. The 20-pound unit is said to be sized for neat installation in the company's Model 480 series wall cabinets.

Notifier Expands Plant

Notifier Corporation, 3700 North 56th Street, Lincoln, Neb., has announced that development of new products and growing demand for its automatic fire detection systems has made it necessary to double its manufacturing space. As a result, a new addition has been made to its two-year-old plant.

Bliss Earnings Up

E. W. Bliss Co., Canton, Ohio, parent company of the Gamewell Company, Newton Upper Falls, Mass., has announced improved earnings for the second quarter on slightly lower sales. Net income for the first six months of 1961 amounted to $985,214 on sales of $38,337,942, as compared to $938,864 and $42,142,195 for the same period in 1960. Current backlog is about $50,000,000, as compared to $32,500,000 at December 31, 1960.

G-E Introduces "Raser"

General Electric, Communications Product Department, Lynchburg, Va., has announced "Raser," range and sensitivity extending resonator, said to be a technological innovation which improves the distance covered by transistorized two-way radio units up to 43 per cent. It is claimed to give transistorized units a sensitivity of better than 0.5 microvolts, and it will be made a part of all high-band G-E Progress Line mobile radios shipped after September 4.

Shallow-Draft Rescue Boat

Fire & Rescue Boats, Inc., 2525 South Ashland Avenue, Chicago 8, Ill., is currently demonstrating its water-jet-propelled fire, rescue and patrol boats. Available in 18 and 19-foot single-jet and 24-foot twin-jet models, they are claimed to be capable of speeds up to 40 mph in extremely shallow water with pumping capacities of 1,000 to 5,000 gpm. In the Los Angeles County Fire Department photo shown, the boat is said to be operating at 43 mph in 7 inches of water.

Cincinnati Buys Motrac

A contract for 126 transistorized Motrac mobile radios has been awarded to Motorola, Inc. by the City of Cincinnati. The units will be installed in fire department vehicles, police cruisers and

Make your fire fighting more effective with this *close-approach* and *fire entry* equipment

The famous **WHEELER** FIRE KING
. . . unmatched for fire entry

Sturdy, 3-ply fire entry suit. Famous Tropic-Weave underwriter's grade aluminized* asbestos as outer layer. 100% wool middle layer. Neoprene coated fiberglas inner layer is vapor and liquid barrier against acids, live steam, etc. Hard hat built into helmet . . . pyrex vision piece . . . federally approved one-piece zipper . . . ample room for *air* pack inside. The standard for industrial and municipal departments. Ask your distributor or write.

*"Scotch-Shield"

PROXIMITY SUITS Underwriter's grade aluminized bunker coats, pants, helmets, boot covers and gloves. Ideal for close-in work.

POWER MEGAPHONES Issue effective commands. Powerful transistor units. 3 styles...pin-point or flare sound patterns.

BLANKETS in Heat-Resistant Materials Durable weather resistant case with fast-release door; wall mounting rings and sturdy carrying handle.

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THE MARK OF QUALITY
JANESVILLE APPAREL CO.
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TURN-OUT SUITS

QUALITY
because that is what the JANESVILLE label has always represented.

SAFETY
because JANESVILLE coats may be trimmed with SCOTCHLITE reflecting tape.

COMFORT
because JANESVILLE coats are available in any body length and sleeve length required.

PROTECTION
because JANESVILLE offers detachable wool or flannel liners.

EFFICIENCY
because JANESVILLE coats provide the "QUICK-HITCH" Rigid Dee Ring and snap.

The finest coat on the Market!

JANESVILLE TURN-OUT SUITS ARE AVAILABLE WITH THE NEW ALUMINIZED FABRIC THAT REFLECTS 90% OF RADIANT HEAT!

Janesville APPAREL CO. JANESVILLE, WIS.

highway maintenance trucks. Also included in the contract are two 250-watt base stations and eight remote control consoles for the various city departments.

Ford Ambulance Conversion

Ford station wagons are being equipped as professional cars for fire and police departments and ambulance operators by Shop of Siebert Associates, Inc., Waterville, Ohio. The firm specializes in custom-converting two and four-door Ford wagons in four basic models. The Aristocrat 1045 shown is on a 154-inch wheelbase and features 45-inch rear compartment headroom with a choice of two, three or four-stretcher capacity.

Demand Mask Quick-Mount

Ziamatic Co., Yardley, Pa., is marketing its Model J "Quick Pac," a weatherproof storage container for demand breathing apparatus which can be mounted on rescue or fire vehicles or permanent industrial walls or surfaces. The unit holds the mask cylinder by spring steel clips that the manufacturers claim will permit a user to strap the equipment on unassisted. By stepping forward, the wearer snaps it out of the holder, ready for use. A zippered polyvinyl chloride cover protects the assembly when not in use.

Plastic Foam Container

L. G. Arpin Co., P. O. Box 284, Caldwell, N. J., is offering its "Super Scepterene Type 2 Foam-Tainer," a plastic container for liquid foam concentrate, wetting agents and similar liquids. Fitted with a molded handle, it is claimed to be unbreakable and not to mar or scratch painted surfaces and to permit visible checking of liquid level.

Please turn the page

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Send now for a variety of Free Samples of Handford Brown Coin Cards and full information about our exclusive fund raising plan. See for yourself how we design coin cards for greater appeal to aid your cause! Get the facts on how these attractive coin cards raise funds faster at far less cost to your budget! Handford Brown Coin Cards are proven *best by test* in campaigns all over our nation for almost half a century.

THANKS! FOR HELPING OUR ANNUAL FUND DRIVE!
Now WE NEED
HELP OUR CAUSE TO HELP YOU!
WE NEED A NEW TRUCK
WHEN DISASTER STRIKES YOU CAN COUNT ON
HELP US TO HELP YOU!

Coin Holders for $3 in dimes!
Coin Holders for $5 in quarters!

Phone, wire or mail this coupon now for your free samples and our plan to raise funds fast!

MAIL THIS COUPON NOW!

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Coytesville, New Jersey

Please rush me FREE samples of your coin cards and full information on how to raise funds fast!

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WINDSOR 4-0454

New Du Mont Radio Unit

Allen B. Du Mont Laboratories, 750 Bloomfield Avenue, Clifton, N. J., has announced new 25 and 50-watt Transicom mobile radio units for use in the 25-54 mc band. Types 125-A and 126-A are said to be compact and low priced and are available in dual-channel and with tone-coded squelch circuits.

Seagrave Earnings Up

The Seagrave Corporation, Columbus, Ohio, has reported one of the best first quarters in its history. President Arnold A. Saltzman said that earnings per common share were $.19 as compared with $.02 during the same period in 1960. Sales during the quarter rose 27 per cent over 1960.

Appointments and Promotions

J. G. Swain, vice president, Waukesha Motor Co., Waukesha, Wis., has retired after more than 30 years of service. A member of the board of directors for 28 years, he has served as an officer of the company since 1949. Prior to that he was general sales manager. He will continue as a director.

F. C. Shulze has been named vice president of sales. He joined Waukesha in 1928, was advanced to assistant sales manager in 1938 and named general sales manager in 1949.

A. Foster Sheller has become vice president of manufacturing. With a background of 27 years experience in engine manufacture and business management, he joined Waukesha in 1957 and was named manufacturing manager in 1959.

Robert A. D'Amour has been named manager of manufacturing sales. He joined Waukesha in 1952 and was appointed assistant sales manager in 1960.

Roland R. Heideman has been named manager of distributor sales. He joined Waukesha in 1934, transferring in 1949 to the California branch where in recent years he has been assistant branch manager.

Robert L. Dickson has been elected president, Walter Kidde and Company, Inc., Belleville, N. J., succeeding John F. Kidde who has assumed the duties of

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TW12

12-Volt RADAR-LITE
Double the voltage — twice the light! Features gun-type "Switch-Lock", another Burgess exclusive!

DEPEND ON **BURGESS**

BURGESS offers dependable lights that meet the rugged requirements of fire-fighters. From the ultra-modern Radar-Lite series to powerful industrial flashlights, BURGESS has the best in portable lights and in batteries for lanterns and flashlights!

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6-Volt RADAR-LITE
40,000 Candlepower Sealed Beam, Exclusive "Switch-Lock", Red Safety Flasher.

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Low cost emergency flasher, visible for full mile.

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chairman of the board. He joined Kidde in 1941 and has been executive vice president for the past two and one-half years and a member of the board of directors.

L. **C. Bailey** has been appointed sales manager, Industrial and Marine Division. He joined Kidde in 1957 and previously was Boston regional manager.

Howard Fairhurst has been named manager, Installation and Service Department, Industrial and Marine Division. He joined Kidde in 1935.

James Nichols has been appointed Metropolitan New York regional manager, Industrial and Marine Division, with offices at 140 Cedar Street, New York City. He joined Kidde in 1942 and most recently was manager of technical services.

Ray Smith has become northeastern regional manager, Industrial and Marine Division, with offices at 2284 Washington Street, Newton Lower Falls, Mass. He joined Kidde in 1960 and previously was manager, national accounts and government liaison.

Donald Starmer, chief of the Roseburg, Ore., Fire Department, has resigned his position to became a factory representative for the Crown Coach Corp., Fire Apparatus Division, 2500 East 12th Street, Los Angeles 21, Calif.,

covering the Bay area, Sacramento Valley and Northern California. He gained wide recognition when, as a lieutenant, he took command of the Roseburg department, following a disastrous explosion on August 4, 1959, and directed successful fire operations. Shortly after, he was appointed chief.

Lee Blanchard, for several years associated with the late O. C. "Bud" Wipper in southeastern fire, police and municipal equipment sales, has announced he will continue in the business under his own name.

Mahoning Valley Supply Company, 500 South Green Road, Cleveland 21, Ohio, has been appointed a warehouse distributor for American Biltrite Rubber Company, Boston Woven Hose & Rubber Division, Boston, Mass., serving the Ohio, southern Michigan and western New York areas.

Francis J. Dunleavy has been appointed general manager, Communications and Controls Division, Radio Corporation of America. He was formerly general manager, industrial controls.

Ansul Chemical Company, Marinette, Wis., has announced the following changes in its fire extinguisher division:

David Francis, salesman in metropolitan New York for the past 12 years, has been transferred to the Cleveland district, effective June 15, 1961.

Edward Bader, representing national and governmental accounts, has been assigned to the New York area. He will continue to work on national accounts.

Burt Felldin, Philadelphia representative, will cover northern New Jersey in addition.

Nicholas Dykstra has been named president, chief executive officer and director of Mack Trucks, Inc., Plainfield, N. J. Most recently a vice president and director of McDonnell Aircraft Corp., he is also former executive vice president of Curtis Wright Corp.

L. L. Robb, sales vice president of Miller-Meteor Div., Divco-Wayne Corp., Piqua, Ohio, has retired after 34 years of service. He will continue to serve the company as a consultant. **Arthur L. Rettig** has been named sales manager. He has worked closely with Robb for the past 14 years. **Robert Rossiter** has been appointed service manager. He has a sales background of 15 years in the field. **Louis O. Kiefer** becomes parts manager with a background of 20 years in sales and manufacture. **William Baille** named

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customer relations manager has a 16-year record in sales management.

R. V. (Dick) Voelkert has joined the sales engineering staff of Pacific Fire Extinguisher Co., 142 Ninth Street, San

Francisco 3, Calif. Dick, after 24 years experience with Elkhart Brass, will service fire departments in California and Nevada.

Traffic Signal Control

Signal Electronics Corp., 417 East 19th Street, Bakersfield, Calif., is marketing a new radio system for use on emergency vehicles to remotely control street traffic signals. Operated by a dashboard switch, the transmitter and receiver units employ coded tones in the 27-megacycle band.

New Fyrepel Plant

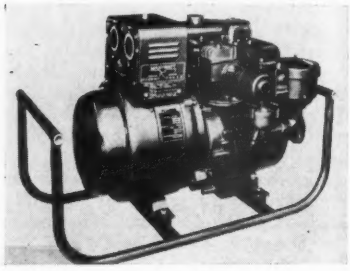
Fyrepel Products Inc., Newark, Ohio, has just recently moved to their new plant No. 3 which includes the main offices. John Weaver, Fyrepel president, states that the latest and most modern production equipment is now in use in producing aluminized glass cloth heat-protective clothing, fire fighting clothing and equipment.

Motorola Built-In Radio Noise Suppression

Motorola, Inc. has introduced "Extender" operation, a device claimed to eliminate impulse interference from radio-equipped vehicles. The unit also is said to reject intermodulation and desensitization forms of interference and range and reception are improved by use of the new circuitry.

Universal Portable Pump

The Universal Motor Company, 418 Universal Drive, Oshkosh, Wis., has introduced a new pumping set called the Aquamaster. It is a 2-inch centrifugal pump driven by a 3-hp Briggs and Stratton air-cooled engine. The lightweight pump is offered as a companion to the company's line of electric generating sets.



Super Lite Generators

Wincharger Corp., Sioux City, Iowa, has announced its "Super Lite" line of portable engine generators. According to the manufacturer, the new features include an automatic idling control for savings in fuel cost and "Therma-Trol" which maintains full power speed until engine temperature permits smooth idling. It is rated at 3,000 watts at 115 V or 230 V.

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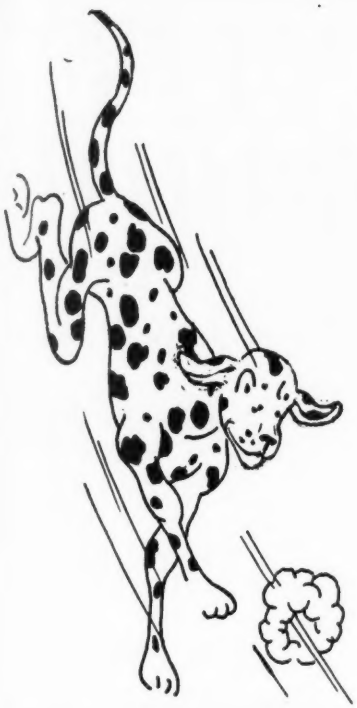

Tradition

Many fine traditions are associated with the fire service. The Dalmatian dog, for instance, has been the recognized mascot of firemen for more than a century.

ADT automatic fire detection and alarm services are also recognized by fire departments as a boon to their early notification of fire and a bulwark against delayed discovery.

Cooperation with the fire services to save lives and property is an ADT tradition — and we are doggoned proud of it!

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Industrial Safety Assn. Elects Bullard

E. W. Bullard, president of the E. D. Bullard Co., Sausalito, Calif., has been elected president, the Industrial Safety Equipment Association. Serving with him as vice president is G. M. Glidden, president, Acme Protection Equipment Co., Grand Haven, Mich. Trustees elected are: R. J. Miller, president, Miller Equipment Co., Inc., Franklin, Pa.; George G. Dickson, vice president, Standard Safety Equipment Co., Palatine, Ill.; Clair M. Hartman, vice president, Pennsylvania Optical Co., Reading, Pa.; and Thomas Johnson, president, Welsh Manufacturing Co., Providence, R. I.

Publications Available

Automatic Sprinkler Corporation of America, Box 360, Youngstown 1, Ohio, has published Automatic Sprinkler Hydraulic Data, 1961 edition. A complete revision and expansion of the 1944 edition, it is authored by Clyde M. Wood, C. E., and is intended as a practical guide for those who design or review fire protection plans or proposals. It contains detailed explanations and examples of methods and procedures, hydraulic theory, drainage calculations and friction loss tables.

The handbook, which is 300 pages in length, may be ordered from Automatic Sprinkler Corp. or The Bookmailer, Inc., Box 101, New York 16, N. Y. The price is $10.00 postpaid in the United States and Canada.

Sun Electric Corp., Harlem and Avondale, Chicago 31, Ill., has published a 60-page mechanic's "Tune-Up Handbook," designed to provide step-by-step procedures for all engine and electric tune-up using modern testing equipment. Copies may be obtained from Sun representatives or by writing direct.

Elkhart Brass Mfg. Co., Inc., Elkhart, Ind., has published a new 76-page catalog describing its line of brass fire fighting supplies and extinguishers. Ask for Catalog J.

Manufacturing Chemists Assn., Inc., 1825 Connecticut Avenue, N. W., Washington 9, D. C., has issued pamphlet SD-67 (revised), Hydrocyanic Acid. It details properties and recommended safe handling and use practices including fire control. The cost is 30 cents. □□

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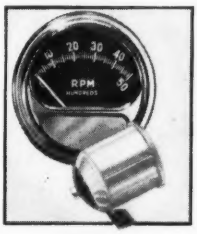

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Annual reports

Forest Service, U. S. Department of Agriculture—Director Merle S. Lowden of the Division of Fire Control, reports that fire losses in 1960 made it one of the all-time bad fire years for the U. S. Forest Service. There were 12,817 fires on the national forests—the greatest number since 1940. The 421,000 acres burned was the largest acreage burned since 1942. The Forest Service's use of aircraft for 1960 set a record with 48,069 hours of flying time. This was 47 per cent more than 1959 and nearly three times the 1956 use. Fixed wing aircraft were flown 38,838 hours and helicopters 9,231 hours.

Chicago Civil Defense Corps, Fire and Rescue Service—Deputy Supervisor Robert A. Benker reports that the corps' eight trucks traveled a total of 15,480 miles in response to 340 fire calls and 281 special duty calls. The members expended 9,587 man-hours.

Southwest Research Institute, Fire Research Activities—In his report for the fiscal year ending September 30, 1960, Director Robert C. DeHart, Department of Structural Research, Fire Protection Section, reports on specific research programs completed and in progress. Among the completed projects are: Development of Extinguishing Agents for Large Magnesium Fires; Feasibility Study of Explosion and Fire Detection for Jet Aircraft Engines, and Products of Combustion, a review of the qualitative and quantitative values of smoke, heat and toxic gases present in fires.

Colorado Springs, Colo.—Chief F. H. Lausch reports the department responded to 755 alarms in 1960. The insured fire loss amounted to $66,894.06. Based on the 1960 estimated population of 70,194, he reports a per capita fire loss of 95 cents.

New South Wales, Australia—Chief Officer H. W. Pye reports a total of 10,879 alarms in the metropolitan area, a decrease of 1,786 from 1958.

Rochester, N. Y.—Fire Chief George L. Holzschuh points out that fire prevention and fire training were emphasized during 1959. While total alarms increased over the previous year, fire losses were substantially reduced, from $1,428,161.58 in 1958 to $386,016.33 in 1959. The per capita loss $1.15 was the lowest in at least six years.

Bakersfield, Calif. — Chief Engineer Charles P. Linnell, in his first annual report, pays tribute to Phil C. Pifer who retired as chief engineer September 1, 1959. While the department answered almost 100 more alarms than in 1958

Continued on page 861

SAFE-guard
THE LIVES OF THE
men
SERVING THE FIRE DEPARTMENT
fire fighters
CAN PERFORM MORE EFFECTIVELY WITH MAXIMUM SAFETY

a NEW CONCEPT *of emergency traffic control*

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MANPOWER UNITS

Continued from page 759

and ladder companies throughout the city. The squadron was given a first-alarm district equal in area to a third-alarm response, and rolled in with an average crew of 12 men—enough to furnish two or three extra men to each company on a first-alarm assignment—and a very good dividend for the one man a company might have lost through his detail to the squadron.

In 1914, Chief Clancy organized Squadron No. 2 and disbanded Ladders 13 and 14, assigning their personnel to the two squadrons. A third squadron was added in 1915 by changing Engine 13 to a squad unit organization. The three squadrons continued as manpower units until World War I conditions caused the return of Engine 13 to regular company operations, and the discontinuance of Squadrons 1 and 2.

In 1913, Charles H. Fox designed the first booster-equipped apparatus and constructed 10 of these hose cars, with water tank, hose reel and front-end-mounted pump, for the Cincinnati Fire Department. Two of the apparatus were assigned to units designated as "flying squads" in recognition of their speed and assignment to boxes throughout extra large districts in the high-value areas. The other eight booster combinations went to engine companies around the city and did not operate as flying squadrons in the sense of being primarily carriers of extra personnel. They accomplished somewhat of the same result by frequently rolling in ahead of their scheduled order and extinguishing fires with the booster line while the horse-drawn companies "due" ahead of them were stretching in, or by furnishing needed men to companies already at work.

A few other cities also put flying squadrons into service and the idea generally worked well, until adoption of two-platoon working schedules and motor apparatus caused the transition of the flying squadrons into rescue squads, as had been done in Detroit, or into other special-service units.

Paradoxically, the practice of a number of cities of dividing the fire force into two platoons without a commensurate increase in quotas revived the squad idea for relieving manpower shortage to greater importance than it had had as a solution to the meal-leave problem of continuous-duty days. When Minneapolis installed the two-platoon system in April of 1917, three auxiliary squads were put in service to divide the city and respond to every alarm to give manual aid to the other companies. St. Paul adopted the same plan and installed two squad units. Newark also made the squad system a part of the reorganization plan when the two-platoon schedule was adopted.

(To be continued)

Parked Car Hampers Men Fighting Boston Blaze

An illegally parked auto blocking a hydrant recently hampered Boston firemen in battling a two-alarm fire in an apartment building. When firemen arrived at the scene, they found the nearest hydrant blocked by the parked car. They were forced to go farther down the street for their water supply.

A police officer had noted the parked car earlier and made an effort to locate the owner. When he was unable to do so, he "tagged" the vehicle. A police official said this was the limit of their authority in such a case. They can order the vehicle towed away only if a complaint comes from the fire department, he said.

When the fire department found the hydrant blocked, police attempted to have the parked car towed. The bumper-to-bumper line of parked cars along with fire equipment in the area prevented a wrecker from getting a hook on the car.

REVOLUTIONARY! **The NEW "SIRENMASTER" REVOLVING WARNING LIGHT AND SIREN COMBINATION.**

Weight 19 lbs. • Height 14" • Diameter 11"

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Combining sound and sight, the new SIRENMASTER warning light and siren combination produce powerful warning signals that clear the way with expediency and safety. Note the many new features and advantages. Economy of installation . . . siren mounted at highest point for best sound projection without interference of full 360° revolving warning light. Functional advantages of the *only forward projecting* mechanical siren now in use, eliminating any doubt in the public's mind from which direction the emergency vehicle is approaching. Avoids the hazard of vehicle obstruction to fire trucks, ambulances and police cars.

The SIRENMASTER revolving light combination unit is available in 2 or 3 seal beams. Hermetically sealed gear case in light insures more efficient and longer trouble-free operation. Because of forward directional sound feature, there is relatively little backwash onto the vehicle—will not interfere with radio communication or conversation. Forward penetrating sound projection of the SIRENMASTER—only 22 amp. consumption, and the 90 or 120 sharp impulses per minute (depending on the model) of the revolving light, assures a powerful combination of dependability, greater efficiency and safety—not only for emergency vehicles, but the public as well.

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Baled Paper Fire Gives L. A. County Tough Fight

Burning bales of paper at Dairy Valley, Calif., salvage yard caused Los Angeles County firemen to stretch more than 10,000 feet of hose because of water shortage. Mountain patrol units were used to patrol perimeter and check for spot fires
—L. A. County F. D. photo by Captain R. Bird

A stubborn paper salvage plant fire in Dairy Valley, Calif. caused Los Angeles County firemen to stretch 10,600 feet of hose with three 2½-inch lines on April 12. The long lays were necessary because there was insufficient water in the vicinity of the Bel-Art Paper Co., 10719 East 166th Street, to quell the blaze in an approximate acre of baled paper.

The alarm was received at 12:36 p.m. by the County's main dispatching center, and Engine 51 out of Engine 115's quarters and Engine 20 out of Engine 30's quarters responded—the two first-in regular companies were out for a hay fire. Engine 23, Truck 20, Rescue 20 and Battalion 8, Chief Walter Meagher, also responded. Subsequent alarms brought Engines 34, 94, 35, 17, 31, 25, 30, and 2 to the scene.

Deputy Chief John Duncan also responded and ordered Mountain Patrol units 91 and 61 in to circulate constantly throughout the area and extinguish spot fires which were occurring principally in the dry grass of surrounding pasture lands. A constant check was also maintained on nearby hay stacks.

Dual 2½-inch lines were stretched from one hydrant for 3,900 feet with four pumpers in relay. A single 2½-inch line was laid 2,800 feet with three pump trailer units used to boost pressure. A wetting agent was also used to extinguish the closely packed bales. Five companies remained at the scene the following day. A class of recruits from the Gehr Training Center responded for observation and also were used in the extensive overhaul operation. ***Cliff Dektar***

Bond Issue Fails; Fire Department Quits

The Goodman, Mo., 10-man volunteer fire department resigned in a body recently when a $5,000 bond issue to buy a new fire truck and repair an old one failed to carry a special election by three votes. Fire Chief E. E. Mathis claimed the old truck was too dangerous to drive. Mayor Carl Diggs said the Anderson and Fort Crowder Fire Departments, as well as units of the Missouri Forestry Division, agreed to help in case of emergency in the town of 500.

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THE CHALLENGER CORPORATION

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ANNUAL REPORTS

Continued from page 858

(1,201 compared to 1,104), total fire losses declined from $170,675.41 to $156,834.10.

New Rochelle, N. Y.—Fire Chief Walter R. Bell reports that the department responded to a total of 1,067 alarms of fire, investigations and requests for emergency assistance. This is an increase of 10 per cent over the 1958 total. The dollar fire loss amounted to $216,749, which is a reduction of $66,000 from the 1958 loss and approximately 28 per cent lower than the average fire loss for the preceding five years. A new 100-foot aerial ladder truck was placed in service and a 1,000-gallon quad ordered during 1959.

Singapore, Singapore Colony—Chief Fire Officer J. Angus reports 1,692 calls during 1959. While there were 43 less calls than in 1958, property losses were estimated at $1,391,343, an increase of $216,254.

Melbourne, Australia—Chief Officer W. T. Aldridge, M. I. Fire E., J. P., reports 17,270 alarms during the year ending June 30, 1960, an increase of 1,504 over the previous year. The number of fires increased by 1,385, and is attributed to the rapid growth of population and buildings.

Iowa State University, Engineering Extension, Ames, Iowa—R. E. Patterson, Jr., associate director, reports that a total of 3,609 Iowa firemen were registered in fire training classes during the year ending June 30, 1960. Keith Royer, supervisor of firemanship training, pointed out that the total enrollment of 3,609 represents 41,087 total hours of instruction, an average of 11.3 hours for each man enrolled.

Kitchener, Ont.—Chief K. R. Putnam reports the official opening of the new headquarters fire station on September 1, 1960. Because of the tremendous expansion in the last few years by reason of annexation, he believes consideration should be given to construction of a new substation and relocation of another station.

Waterloo, Iowa—Chief Ray Tiller reports that the department answered 995 alarms, 953 in the city and 42 from outside of the city. He reports an estimated fire loss of $139,445.13, the lowest since 1956.

Los Angeles, Calif.—Chief Engineer William Miller reports that the department responded to 38,745 incidents during the year ending June 30, 1960. Of these, 14,134 were actual fires. Efficiency was increased in fire fighting operations during the year by the purchase of 145 self-contained breathing apparatus, and by extension of the department's salvage services into areas considered inadequately protected. □□

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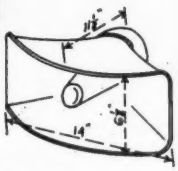

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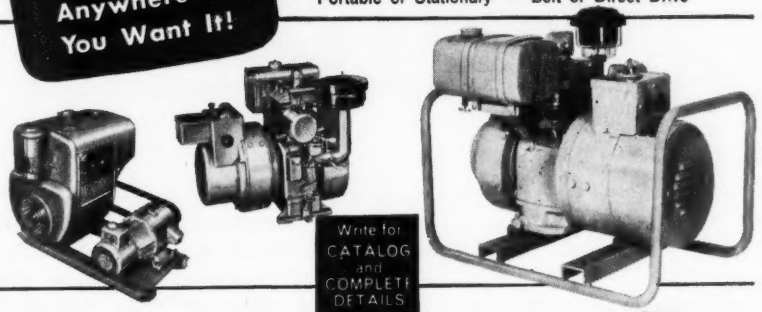
Portable or Stationary • Belt or Direct Drive



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Nassau County Dedicates New Training Center

Nassau County firemen stage mutual aid drill in fire training buildings as climax to dedication ceremony. Men fought actual fires in planned demonstration program

Fire fighters from 71 Nassau County, N. Y., fire departments and a large crowd of visitors participated in dedication ceremonies on Saturday, July 22 to mark the official opening of the County Firemen's Training Center at Old Bethpage, N. Y., by A. Holly Patterson, county executive officer. Administered by the Vocational Education and Extension Board, the new school is under the direction of Chief Instructor James C. Rogers.

The present $1 million plant consists of an administration and classroom building, fire equipment and storage building, a 2½-story fire building simulating a residence, apartments and industrial complexes; and a one story commercial building simulating a taxpayer-type structure. Water mains and hydrants in the area are supplied by elevated storage.

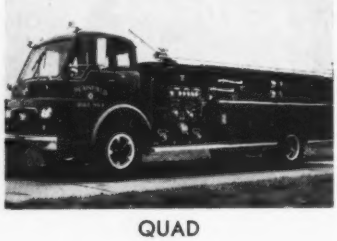
Sprinklers and fire detectors are installed in certain sections and thermocouples are provided for temperature measurement. Alarm systems installed include Gamewell Co., New York Telephone Co., Alarm Alerting and American District Telegraph Co.

The entire plant is located in a park-line area of the county and is provided with paved access and parking areas, roadways and drill grounds. Future plans call for construction during 1961-62 of a six-story drill tower, a smoke house, concrete oil pits and a pumper test pit.

San Diego Rejects Fire-Police Integration

The San Diego, Calif., City Council recently voted unanimously to shelve its city manager's plan to integrate the fire and police departments. Fire Chief Ray Shukraft attributes the decision to pressure from an aroused public which supported the city firemen, with the help of state and county fire organizations, the International Association of Fire Chiefs, the International Association of Fire Fighters, and the National Fire Protection Association.

Roi B. Woolley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Fireman and Child Die At Detroit Blaze

Fireman Stephen Szpunar died of a heart attack after vainly attempting to rescue a three-year-old boy from a fire in a two-family dwelling on the east side of Detroit recently. A five-year-old sister of the dead boy said her two brothers were lighting papers at a gas heater and taking them into a rear closet just before the fire started. Acting Chief James T. Burke of Battalion 10 said "the whole place was in flames when we arrived." Twenty firemen with three pumpers and a ladder truck battled the fire for 45 minutes before it was put out.

Fireman Szpunar entered an upstairs bedroom through a window and was joined shortly after by Fireman Frank Bauer. Bauer said Szpunar, gasping in the heavy smoke, was forced back to the ground. As he returned to the apparatus for a mask, he collapsed. He was dead on arrival at East Side General Hospital. Meanwhile Bauer found the dead boy on a bed. Szpunar had been a member of the department since 1945.

TV Puppets Destroyed In Connecticut Blaze

Howdy Doody, the freckle-faced puppet of TV's kiddieland, will have to seek another self. Howdy and 300 other dolls used on children's television shows were damaged or destroyed in a fire at the studio of Rufus Rose, their creator, in Waterford, Conn., on April 23. The loss was estimated at $57,000.

Rose was watching television when he noticed the fire. He tried to call the Waterford Fire Department, but the line went dead before he could give the address. His wife rushed next door to the home of a relative to use the phone. Firemen confined the blaze to the workshop.

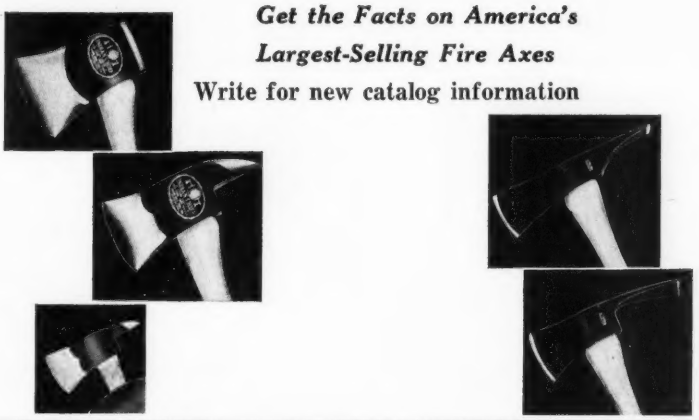
Tom Magner

Rhode Island Instructors Plan to Hold Fire Academy

The Rhode Island Firefighters Instructors Association will conduct its third annual fire academy at Newport, R. I., October 13, 14 and 15. The academy is sponsored by the State of Rhode Island Division of Adult Vocational Education.

The academy is open to all fire fighters in the state. Twelve-hour courses will be given in various phases of fire fighting. In addition to the standard courses usually covered at a fire college, there will be courses in radiation hazards in fire fighting and Scuba techniques. Fire fighters who attend for the required hours will receive certificates from the Division of Adult Vocational Education.

Fire fighters interested in attending should contact Captain Michael J. Fox, State Supervisor of Firemen Training, 903 Broadway, East Providence, R. I.



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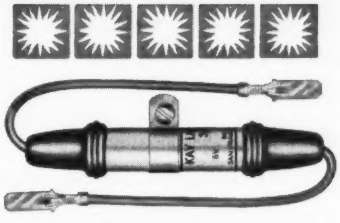

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The round table...

Discussion of current fire department and fire management problems

Problems of Off-Time Employment

THIS IS THE LAST installment of the Round Table on problems of off-time employment.

Next month's topic will cover wetting agents. The questions are given in a box elsewhere in this issue.

Readers are invited to participate in the discussion. Address replies to the Round Table Editor, FIRE ENGINEERING, 466 Lexington Avenue, New York 17, N. Y.

The Discussion

Thomas G. Lennon, Chief, Saskatoon, Sask.: In Saskatoon we have a "no working off the job" clause in the rules and regulations of our department. A clause to this effect has also been added in the union's working agreement.

I note some chiefs believe that better hours, more pay and all-round better working conditions should improve this situation. This may be true, and no doubt would be accepted by most of the fire fighters in the various departments. But we still have those few who, regardless of good hours and working conditions, will still continue to seek employment in off-duty hours.

During any emergency such as war, etc., where a definite shortage of manpower is evident, councils have allowed fire personnel to help by taking employment in off hours. Under these conditions, I am in favor of fire personnel or any other shift worker taking such employment. But during times when unemployment is so high in the United States and Canada, I believe the strongest type of legislation should be enforced against all types of shift workers (not just those of the fire fighting profession) to prevent them from seeking employment outside their own profession or job.

I believe that the unemployed person, if he is capable, should be given every opportunity to get a job and that these jobs should not be filled by people already secure in steady employment.

Milton L. Rogers, Chief, San Antonio, Tex.: San Antonio departmental rules forbid outside employment of any nature, but have been modified by mutual agreement so as to allow a member to engage in outside work if his departmental efficiency is not impaired, and the work does not reflect on the fire service as a whole, as in the case of bartending, taxi driving, etc. A member may obtain a work permit from the chief. He has the discretionary power in this case. It has been my experience that, in some off-duty jobs, firemen render a real public service when they accept jobs such as driving school buses, trimming trees, etc. No worker could accept this employment on a full-time basis as a means of livelihood.

The Bureau of Labor Statistics has revealed that dual jobs, "moonlighting" as it is termed, has become a part of the American tradition, and is common in many callings. It is a product of our ever-increasing high standard of living and the shorter work week. In the fire service, it had its inception during World War II, when fire fighters were urged to accept off-duty employment because of

THIS MONTH'S QUESTIONS

- **Do your department regulations forbid members from engaging in outside employment?**
- **If so, do you believe the rules should be modified to permit such work? If not, do you believe the rules should and can be changed to increase control over such activities?**
- **In the event a fire fighter is injured while engaged in off-time employment, do you believe his pension or other benefits may be impaired in any manner?**
- **Do you believe legal action against a fireman for outside work activities may jeopardize his position with the department?**
- **Do you believe that better department conditions in regard to salary and working hours will eliminate multiple job holding by firemen?**

the manpower shortage. The fire fighter is in a somewhat better position to exploit this situation because of his unorthodox work schedule. Few individuals would hold two jobs if they could maintain an adequate standard of living on one pay check.

Our local pension act gives 24-hour coverage and it must be admitted that public opinion as a whole is opposed to this feature of the act—conferring benefits for disabilities incurred in outside employment.

My opinion is that outside work should be strictly controlled, and in no event should reflect on the fire service.

Legal action against a fireman because of any outside activity would, in my opinion, reflect on the fire service as a whole. Because of this it would be prejudicial to the fireman's position in the service.

Better salary conditions in the fire service would bring the dual employment situation to a more proportionate basis. Its elimination is doubtful because the free enterprise system, on which our economy is based, dictates otherwise.

Reynold C. Malmquist, Chief, Minneapolis, Minn.: Our regulations permit firemen to engage in outside employment. I do believe that in the event there isn't sufficient work for the public as a whole, then rules should be changed whereby a fire fighter would not be allowed to hold two jobs.

In the event a fireman is injured while engaged in outside work, he remains on the payroll for 17 days, then goes off and is ineligible for any pension benefits.

I do not believe that better department working conditions would eliminate multiple job holding by firemen.

W. J. Lewis, Chief, Norfolk, Va.: We do have rules forbidding firemen from working on their off time, but they are not enforced.

In the event a man is injured while engaged in his off-time work, his pension and other benefits would be impaired. Legal action for outside work would also jeopardize his position with the department.

Better working conditions in regard to salary and working hours will eliminate multiple job holding by firemen.

W. N. Bates, Chief, Elyria, Ohio: Our department regulations do not forbid a fireman from taking a job on his off time. Should he be injured in such employment, his pension and other benefits would be impaired.

I believe better conditions, especially higher salaries, will eliminate multiple job holding by firemen.

John J. Killen, Chief, Baltimore, Md.: Our fire department regulations forbid members from engaging in outside employment. I do not believe these rules could be changed. No department can afford to supervise the actions of off-shift firemen. If off-shift work is reported and proved, members of the fire department should be punished.

In Baltimore, should a fireman be injured in off-duty work, his pension could

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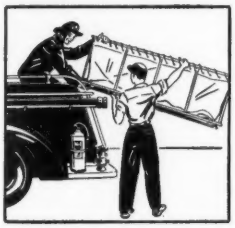
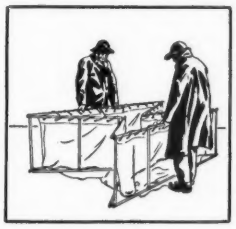
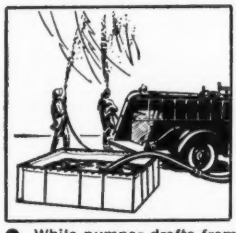


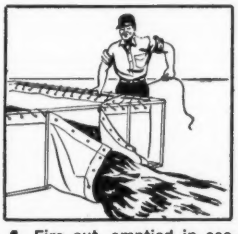
1 Unloaded from fire truck or tanker and set up in less than one minute.



2 Two men easily open. Tanker or Mutual Aid Trucks fill tank.



3 While pumper drafts from Fol-Da-Tank, the tanker may get additional water.



4 Fire out, emptied in seconds and ready to reload. Nothing left behind.

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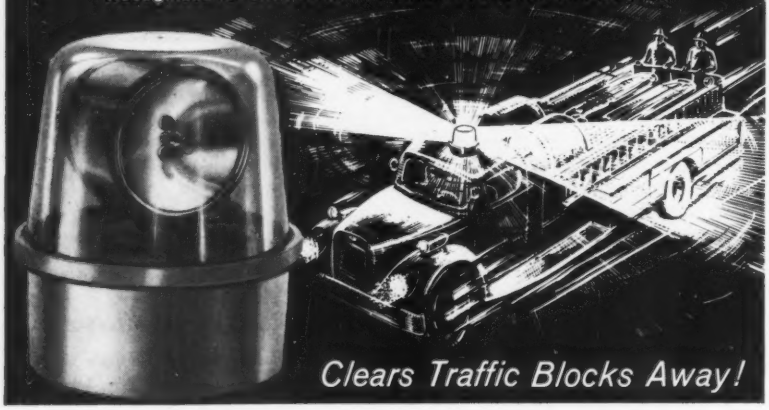

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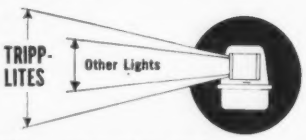

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be affected, depending on his age and years of service.

Should the legal action taken against a fireman be such as to cast great reflection on the fire department and he is convicted, he could possibly be dismissed.

Better working conditions will eliminate multiple job holding by firemen.

George L. Holzschuh, Chief, Rochester, N. Y.: Before a fireman can take outside work, permission must be granted by the fire chief.

In the event of injury on such a job, pension and sick benefits could be affected. Legal action taken against a fireman for outside work activities would jeopardize his position with the fire department.

I believe that in some cases better department conditions might eliminate multiple job holding by firemen, but in most cases, it wouldn't.

Ed. J. Barksdale, Chief, Hattiesburg, Miss.: Our department regulations do not forbid a fireman from taking a job on his off time. I believe the rules should be changed to increase control over such activities.

Should a fireman be injured while engaged in this off-time employment, his pension and other benefits would be affected. Legal action against him might jeopardize his position with the fire department.

I believe better conditions would eliminate multiple job holding. Fire fighters should receive a salary equal to other workers and should have shorter hours. If so, then we could insist upon their not taking outside jobs.

William M. Daly, Chief, Buffalo, N. Y.: Our department rules do not forbid members from taking outside employment. In the event they should be injured while engaged in such activities, pension or other benefits would not be impaired.

I do not believe better department conditions would eliminate multiple job holding by firemen.

Frank S. Sandeman, Chief, Long Beach, Cal.: Our department regulations permit members to engage in outside employment, provided there is no conflict of interest between the outside job and the fire department job.

Pension and other benefits would be affected, should a fire fighter be injured on his outside job. Legal action against him for outside work activities might jeopardize his position with the department.

It is doubtful whether better conditions will eliminate multiple job holding. Some men will work off duty regardless.

Otto M. Stoegbauer, Chief, Oshkosh, Wis.: We do have a departmental rule that governs off-duty employment that reads as follows:

"Any member of the fire department when off duty shall not work in any industry, trade or craft, nor as a bartender, cab driver, or in any position or occupation where a city license is required.

"Any member of the department when

off duty may take any of the following employments:

"(a) Supervising or officiating for the City Recreation Department of the Board of Education or for persons carrying on recreational activities.

"(b) Miscellaneous odd jobs, the doing of which does not impair the member's efficiency in his work in the department."

I should like to call your attention to rule (a). To begin with, it is in direct conflict with the paragraph prohibiting the taking of employment where a city license is required. No person can qualify, for example, as a referee or sports official without a license to perform; secondly the term "miscellaneous odd jobs" covers a multitude of jobs. A fire chief must also qualify as a "King Solomon" to unscramble that category. Actually, washing walls, cutting grass, or other servile work bordering upon the ordinary are today acceptable for admission into labor unions and disqualify firemen that belong to the fire fighters' unions.

We generally control the rule by requiring the individuals taking such employment to qualify the work with the fire chief before performance. If the individuals evade the qualification and a formal complaint is registered, the punishment can be severe or mild depending upon the evidence that testimony presented before the police and fire commission by the complainant.

Pensions generally are not impaired, for the statutes provide some types of protection to the employee for off-duty disabilities that are of a crippling nature that would result in total or partial disability. In some cases it would depend upon the years of service, and in others as the local laws apply. Any legal action that might result would tend to discredit the entire fire fighting force not

NEXT MONTH'S QUESTIONS

- Do you now use wetting agents in your extinguishing operations?
- If so: (a) Do you use them at all general fires or only for specific applications? (b) Do you use permanently mounted or portable equipment to proportion them into hose lines?
- If not, do you intend to adopt wetting agents in the foreseeable future?
- What advantages have you found in the use of these agents?
- What disadvantages have you been able to determine due their use?

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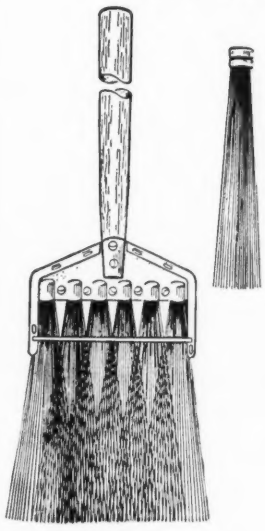

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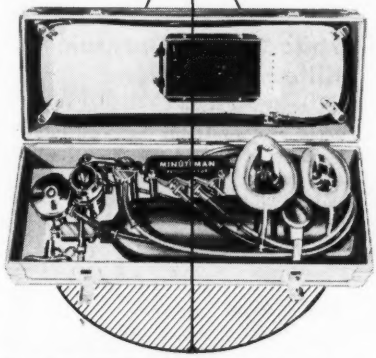

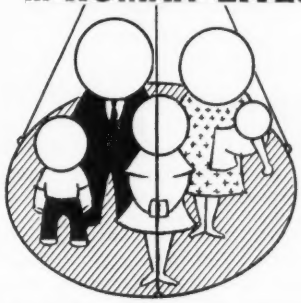

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only because of the adverse publicity received, but would finalize in rigid rules of nonparticipation in outside work and arouse public opinion that could be a serious retardant to good public relations.

I am fully convinced that those now working on off days will continue to seek out extra employment regardless of their salary status. Others who do not work on off days will continue their pattern of living.

Of prime concern is the moot question: Will the continuance of off-duty work relegate the fire service to a secondary level of job employment that could fatally result in poor performance or stifle the devotion and enthusiasm one must have to give good outstanding service? □□

Film Subcommittee Asks Fire Fighters for Help

Chairman Emmett Cox, NFPA Visual Education Committee, has appointed Dale K. Auck, Federation of Mutual Fire Insurance Companies, as chairman of a subcommittee to index and list all fire films known to exist. Serving with him are Robert Hamm, Indiana Rating Bureau and Harry Wolff, Western Actuarial Bureau. Chairman Auck has requested that all persons in the fire service who have knowledge of new films on fire fighting, fire prevention, etc., inform him so that the forthcoming index can be as comprehensive as is possible. Correspondence should be addressed to Dale K. Auck, director, Fire Protection Division, Federation of Mutual Fire Insurance Companies, 20 North Wacker Drive, Chicago 6, Ill.

Philadelphia Fireman Killed in Collision

Fireman Rolla Berg, 49, died July 24, when the apparatus he was riding in response to an alarm, collided with an automobile and then careened into a store front. Five other firemen and three civilians, passengers in the car, were injured.

June Fire Losses

Estimated fire losses in the United States during June amounted to $103,348,000, the National Board of Fire Underwriters reported.

This $103,348,000 loss represents an increase of 24.8 per cent over losses of $82,829,000 reported for June 1960, and an increase of 11 per cent over losses of $93,103,000 for May of this year, according to Lewis A. Vincent, NBFU's general manager.

Losses for the first six months of 1961 now total $635,017,000, an increase of 10.6 per cent from the first six months of 1960, when they amounted to $573,971,000.

These estimated losses include an allowance for uninsured and unreported losses.

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RI-7

Coming events

Sept. 6-7—**New England Association of Fire Marshals.** Second Annual Conference will be held at Griswold Inn, Groton, Conn. For details contact: R. R. Mulligan, Secretary, 76 Emily Road, New Haven 13, Conn.

September 13—**Southern California Conference of Fire Prevention Inspectors.** Monthly meeting, Santa Ana. For information, write Ira A. Anderson, Corresponding Secretary, c/o Fire Department, Rialto, Calif.

September 14—**Delaware Fire Chiefs Association.** Annual meeting, Dover Fire Department, at 8 p.m. For information write, E. Reynolds Bradley, Smyrna, Dela.

Sept. 15-16—**Delaware Volunteer Firemen's Association.** Annual meeting, Dover. For information, write E. Reynolds Bradley, Secretary, Smyrna, Dela.

September 24—**Great Lakes Association of Fire Chiefs.** Annual meeting in connection with IAFC Conference, Las Vegas, Nev. Secretary-Treasurer, Willard G. Compton, Chief of the Fire Department, Springfield, Ohio.

September 25—**Pacific Coast Inter-Mountain Association of Fire Chiefs.** Annual meeting in conjunction with IAFC Conference, Las Vegas, Nev. Secretary-Treasurer, Stephen Edmondson, 1248 North Marengo Avenue, Pasadena, Cal.

September 25—**Missouri Valley Association of Fire Chiefs**—Annual meeting in conjunction with IAFC Conference, Las Vegas, Nev. Secretary-Treasurer, Chief Raymond G. Davis, Sedgwick County Fire Department, Wichita, Kans.

Sept. 25-28—**International Association of Fire Chiefs.** Annual meeting, Las Vegas, Nev. Executive Director, B. Richter Townsend, 232 Madison Avenue, New York 16, N. Y.

Oct. 1-5—**California State Firemen's Association.** Annual meeting, Bakersfield. For information write E. L. Albrecht, Sr., Secretary, P. O. Box 1256, Santa Ana, Calif.

Oct. 5-7—**The Fireman's Association of the State of Pennsylvania.** Annual meeting, Scranton, Pa. For information contact Arthur C. Potter, Secretary, P. O. Box 703, Lewistown, Pa.

October 11—**Southern California Conference of Fire Prevention Inspectors.** Annual meeting, Los Angeles. For information, write Ira A. Anderson, Corresponding Secretary, c/o Fire Department, Rialto, Calif.

Oct. 19-22—**Nebraska State Volunteer Firemen's Association.** Annual meeting, Norfolk. Secretary-Treasurer, Russell D. Salak, P. O. Box 312, Schuyler, Neb. □□

Lightning Strikes Twice, Three Firemen Felled

On July 10 lightning struck a restaurant-motel near Whiteface Mountain in New York State, starting fires in the attic and in a wall. The Wilmington Fire Department responded and while extinguishing operations were under way, a second bolt struck the building. Two firemen on the roof were knocked down, but managed to retain their positions. A third firemen, inside the attic, was knocked down and stunned. No serious injuries resulted. *F. Bourassa*

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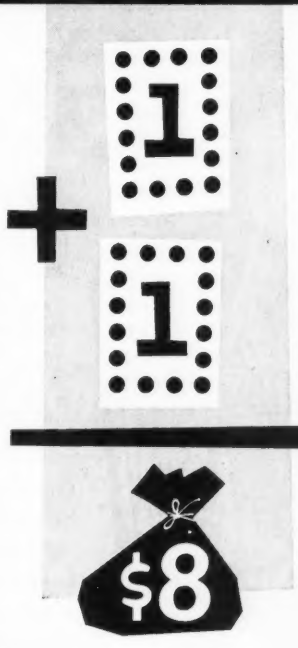

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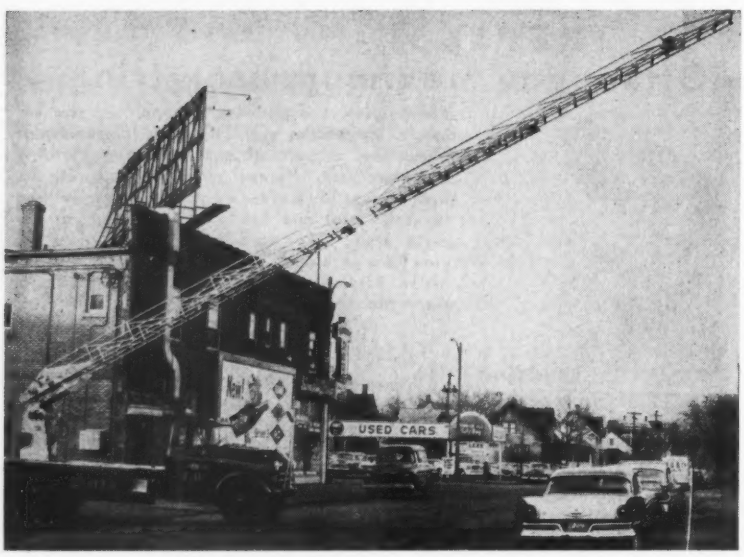

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What's burning

The following list includes fires of $10,000 and over in the United States and Canada for the period from July 1st to July 31st.

Selma, Ala.—Kroger & Co., wholesale grocery warehouse damaged.

Ketchikan, Alas.—Tongass Trading Co., Federal Apartments, drug store and Stedman Hotel destroyed. Arson reported.

Clarksville, Ark. — Cater's Hardware Store, Bridges Furniture Store, Young's Department Store and Ben Franklin Store, destroyed. Bystander accidentally fired gasoline being poured into power motor.

Pine Bluff, Ark.—Cotton Belt Railroad shops damaged.

Antioch, Calif.—Waterfront Buildings, including Riverview Lodge Restaurant, Old Santa Fe Railroad warehouse, Antioch Lumber Co., Campanile Theater, Chamber of Commerce office and Tommy's Yacht Harbor housing small craft, damaged.

Lodi, Calif. — Werner's Manufacturing Co. damaged.

Norwalk, Calif. — Los Alisos Intermediate School damaged. Firecrackers.

Oakland, Calif.—E. L. Bruce Lumber Co., damaged.

San Francisco, Calif.—Keystone Apartments at Hyde and Washington Sts., destroyed. Arson by tenant.

San Rafael, Calif.—Northwestern Pacific Railroad tunnel and two apartment dwellings above destroyed. Set by boys.

Sebastopol, Calif.—Apple Town Produce Market, Joe's Budget Shop and Pease Drug Store damaged.

Waterbury, Conn.—160 South Street building housing Kline's Clothing Store and adjacent dwelling damaged.

Wilmington, Del.—Reading Railroad warehouse at Elmsmere Junction, destroyed.

Tampa, Fla.—Early Daniel Co. buildings and Atlantic Coast Line Railroad warehouses damaged.

Atlanta, Ga.—Five business establishments on Georgia Avenue damaged. Losses included: Eastern Supermarket, Georgia Avenue Beer and Wine Store, Alex's Bargain Shop, John's 5 & 10-cent Store and Lischkoff's Department Store.

Chicago, Ill.—Del Mar Hotel damaged.

Pekin, Ill.—Pekin Recreation Center destroyed; garage-apartment damaged.

New Castle, Ind.—Conco Casket Co. destroyed.

Davenport, Iowa—Three buildings of Crescent Laundry and Dry Cleaners, destroyed.

Des Moines, Iowa — Building housing Jim's Billiards, Gay Nineties Tavern, Caplan Bakery, Disabled American Veterans Thrift Shop, Boston Fish Market, Co-operative Thrift Shop Inc., Woods Resale Shop, Cardinal Tailors and vacant store damaged.

Dubuque, Iowa—Eagle Food shopping center building and State Liquor store destroyed.

Lake Mills, Iowa—Two-story building housing Stensrud Drug Store, Forum Cafe and pool hall destroyed; adjoining Sheino Electric & Appliance Store, Honsey Electric Co., Peterson Furniture Co. and American Legion building damaged.

Ashland, Ky.—Black's Marineland, small craft sales and repair firm, destroyed.

Cambellsville, Ky.—Citizens Bank & Trust Co. building housing Key Loan Co., doctor's office, Cole Insurance Agency and apartments, and Hubbard Building housing R. H. Hobbs 5 & 10¢ store, Joe's Cafe and Taylor County Supply Co., destroyed.

Franklin, Ky.—Farmer's Elevator Co. damaged.

Leitchfield, Ky.—Leitchfield Manufacturing Co. destroyed.

Lexington, Ky. — Lexington Casket Co. destroyed.

Hughesville, Md.—Three tobacco warehouses destroyed.

Boston, Mass.—Five-story apartment dwelling on Bowdoin Street housing Phillips Coffee Shop damaged.

Chelmsford, Mass. — Molders Foundry Co. plant destroyed. Lightning bolt.
Holyoke, Mass.—Four-story apartment dwelling damaged.
Norwood, Mass.—Friend Lumber Co. on Route 1, damaged.
Westwood, Mass.—Barn and three work buildings of White Construction Co. on Rt. 128, destroyed.
Anchorville, Mich.—Three buildings of Silver Saddle Riding Academy destroyed.
Holland, Mich.—Conrad Inc., air and space test equipment manufacturers, damaged.
Plainwell, Mich.—Main barn on Dan Arnold's Riverside Stock Farm destroyed.
Pontiac, Mich.—West Side Recreation bowling alley damaged. Believed incendiary.
Zeeland, Mich.—Howard Miller Clock Co. plant damaged.
St. Joseph, Mo.—Modern Hardware and Modern Hi-Fi destroyed.
Las Vegas, Nev.—Nine business firms on Las Vegas boulevard destroyed. Lightning bolt.
Holderness, N. H.—Deerwood Farm Restaurant, south on Rt. 3 destroyed.
Bernardsville, N. J. — Dunleigh mansion of George L. Lee damaged.
Camden, N. J.—Greenbriar Inn at Race Track circle, destroyed.
East Hanover, N. J.—St. Moritz Restaurant on Eagle Rock Avenue damaged.
Glassboro, N. J.—David Goldman & Bros., Inc., basket factory, destroyed.
Paterson, N. J.—Paterson Crystal Salt Co. and Fleetwood Flooring Co. damaged. Arson suspected.
Canastota, N. Y. — Three-story building in downtown business district destroyed; two others damaged.
Cold Spring, N. Y.—St. Mary's of the Highland Episcopal Church destroyed.
Mohegan Lake, N. Y.—Duratach Boat Manufacturing Corporation, fiberglass boat division destroyed.
Mount Vernon, N. Y.—H. L. Green Variety Store at 44 South 4th Avenue destroyed; Genung's Department Store and Ruby Lane Dryfoods Shop at 42 and 46, damaged.
Utica, N. Y.—New building owned by Utica Projects Inc. housing All-State Insurance Co. destroyed. Gas explosion.
Walton, N. Y.—Christ Episcopal Church destroyed. Defective wiring.
Fair Bluff, N. C.—Fair Bluff Milling Co. feed mill destroyed.
Leaksville, N. C.—Home Novelty Furniture Corp. destroyed.
Mount Holly, N. C.—McClure Lumber Co. damaged.
Bowling Green, Ohio—Kenwood School damaged. Arson.
Cleveland, Ohio—Acme Iron & Metal Co., including titanium pile owned by Thompson Remo Woolridge Inc., damaged. Magnetic crane wire broke.
Cleveland, Ohio — Garage and eight trucks of Mr. Softie Ice Cream Co. destroyed. Cigar dropped in spilled propane gas.
Newark, Ohio — Courthouse square building housing Anderson's Sporting Goods Store, Huth's Children's Clothing Center and Mitchell's Men's Clothing Store damaged.
Toledo, Ohio—St. Clair School and adjacent Hillebrand Bros. Furniture Store damaged.
Warren, Ohio—Champion Plaza Shopping Center housing Champion Department Store, Pezzenti's Music Mart and Paar's Drug Store damaged. Discarded cigaret.
Coos Bay, Ore.—Coos Bay Sawmill destroyed.
Corvalis, Ore.—Children's Farm Home destroyed.
Eugene, Ore.—Seneca Sawmill of Aaron Jones destroyed.
Molalla, Ore.—W. J. Avison Lumber Mill damaged.
Portland, Ore.—Redymix Concrete Plant destroyed. Acetylene torch.
Portland, Ore.—Lomac Motors Inc. destroyed. Explosion.
Portland, Ore. — Ross Island & Gravel Co. warehouse destroyed.
Portland, Ore.—Explorations Inc. warehouse destroyed; Georgia Pacific warehouse damaged.
Portland, Ore.—Bob Hartke Trailer Sales destroyed. Bottled gas explosion.
Rickerwall, Ore.—Farm buildings of George Kaupp destroyed.
Rosedale, Ore.—Farm buildings of James Mendenhall destroyed.

Please turn the page

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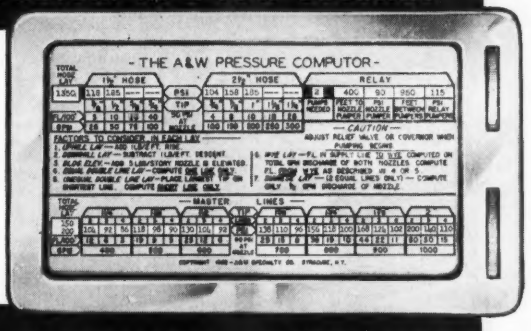
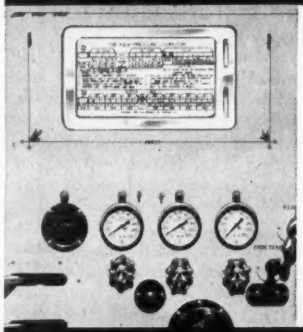
PAYS FOR ITSELF BY CUTTING PUMP, GAUGE and HOSE DAMAGE



The A & W PRESSURE COMPUTOR



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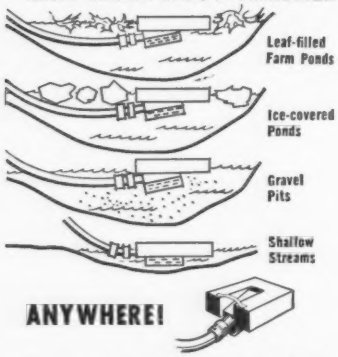

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Strainer and float constructed of 16 gauge welded steel, cadmium plated. Coupling size, 2½" through 5".

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Abottsville, Pa.—Store and feed mill of Richard Hoke damaged.

Bath, Pa.—Genner Bros. warehouse destroyed.

Bryn Mawr, Pa.—Taylor Hall on Bryn Mawr College campus damaged.

Canonsburg, Pa.—Partially completed cafeteria building at Western Pennsylvania Youth Development Center damaged. Acetylene torch spark.

Gap, Pa.—Barn on Steven U. Stoltzfus farm destroyed. Lightning.

Glassport, Pa.—Glassport Lumber and Supply Co. damaged.

Lymanville, Pa.—Barn on John Lyman farm destroyed.

Philadelphia, Pa.—B. Kanther Co., paint-spraying firm owned by Robert Kanther, heavily damaged.

Reading, Pa.—Marathon Knitting Mills plant damaged.

Trexlertown, Pa.—Granary and grain processing plant of Paul H. Marsteller damaged.

Chattanooga, Tenn. — Warren Chapel Negro Church destroyed.

Cooperhill, Tenn.—Hemphill's Ready to Wear Store and Kay's Florist in building owned by A. L. Stepp destroyed; apartments damaged.

Dallas, Tex.—Two-story building at foot of Elm Street, housing restaurant and business firms damaged.

Fort Worth, Tex.—B. H. & W. Manufacturing Corp., 15 miles north at Eagle Mountain, destroyed. Texas National Guard had storage space in building.

Salt Lake City, Utah—Allen Oil Co. destroyed.

Waterbury, Vt.—Barn on John Farr farm, 2 miles n.w. on U. S. 2, destroyed.

Richmond, Va.—Three dwellings in 4500 block East Main St. destroyed; four dwellings and gas storage plant of Crown Central Petroleum Corp., damaged.

Everett, Wash.—Northwestern Lumber & Manufacturing plant destroyed.

Ridgefield, Wash.—H. W. Patee Pontiac Agency destroyed.

Spokane, Wash.—McCollum Motors destroyed.

Sumner, Wash.—Valley Lanes Bowling Alleys destroyed.

Tacoma, Wash.—Long Wayside Inn destroyed.

Black River Falls, Wis.—McCarter's Tire Service and Industrial Saw & Knife Co. destroyed. Sparks from a buffing machine ignited rubber solvent fumes.

Brussels, Wis.—Tavern and home destroyed. Fire believed to have started in the deep fat fryer in the kitchen of the tavern.

Hartford, Wis.—Main plant of International Stamping Co. destroyed. Sparks from electrical equipment ignited paint vapors in the paint shop.

River Falls, Wis.—Half a block of business concerns destroyed. Fire started in Ford Motor Co. agency spreading to Koller Pontiac Co., Chapman's blacksmith shop, Hauth blacksmith and welding shop and two sheds and a barn across the alley. Several large gasoline tanks burst during the fire.

Saylesville, Wis. — Broad Ripple Farm destroyed.

West Allis, Wis.—Dutchland Dairy store damaged. Grease evaporated from french frier and collected in a roof-level cockloft ignited.

Prince Rupert, B. C.—Port Essington Hotel destroyed.

Juniper, N. B.—Flemming & Gibson Lumber Co., Ltd., buildings destroyed. □□

Chicago Installs Lights, Removes Alarm Box Locks

Chicago's Bureau of Electricity recently installed yellow street lights above 900 fire alarm boxes in high-value business districts and densely populated residential areas. The National Board of Fire Underwriters had recommended the lights for quick identification.

Mayor Richard Daley, who made the announcement, also stated that all locks have been removed from the city's 3,218 fire alarm boxes to permit immediate access to them by the public. Previously only fire and police department personnel had access to the key boxes.

M. R. Green

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OBITUARIES

Frank W. Kridel

Frank W. Kridel, 57, executive vice president of New York's Astor and Manhattan Hotels and an honorary deputy chief of the New York Fire Department, died in his sleep on July 4, after a brief illness. One of the best-known hotel men in the country, he was also a leader in fire prevention activities and a sustaining member of the International Association of Fire Chiefs.

In addition to New York, he was an honorary deputy chief in 32 other cities of this country and Canada, and for many years served simultaneously as chairman of fire prevention for the American, New York State and New York City Hotel Associations. In 1951, the New York State Joint Legislative Committee on Housing and Multiple Dwellings awarded him a plaque for his "distinguished public service in the cause of fire prevention." He is survived by his widow, Violet.

O. C. Wipper

O. C. "Bud" Wipper, well-known southern dealer in fire, police and municipal equipment died May 31 at Doctor's Hospital, Coral Gables, Fla. He was buried in Lima, Ohio on June 5.

Morris Chuven

Morris Chuven, 64, dispatcher in the Bronx Central Office, Bureau of Fire Communications, FDNY and widely known New York fire buff died Sunday, July 8 at Roosevelt Hospital after a brief illness. He had been a dispatcher for 15 years.

John Moore

Chief G. J. Skene

George J. Skene, Sr., 62, chief of the East Berlin, Conn., Fire Department for more than 20 years, died July 2 in New Britain General Hospital following a brief illness.

Tom Magner

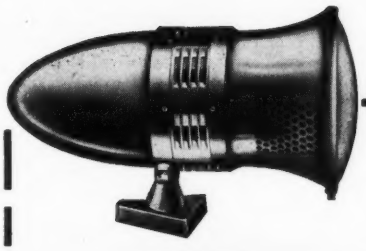
Chief G. H. Thomsen

George H. Thomsen, 48, former chief of the Cos Cob, Conn., Fire Department, died June 29. He was a member of the New England Association of Fire Chiefs and the Greenwich Past Fire Chiefs Association.

Tom Magner

Chief J. L. Copeland

Chief Joe L. Copeland, 66, head of the Selma, Ala., Fire Department for the



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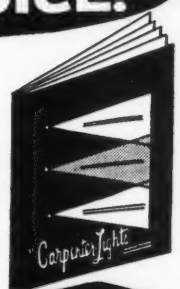

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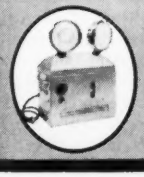

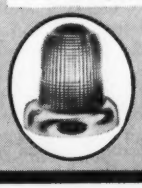

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past three years, died suddenly on June 29 from carbon monoxide lung damage. He was overcome earlier the same day while directing operations at a smoky wholesale grocery warehouse fire.

A veteran of 36 years service, he had served as a captain for 29 years prior to his promotion to chief. He was a member of the Southeastern Division, International Association of Fire Chiefs.

G. A. Mitchell

Chief Frank Sandeman

Chief Frank Sandeman, Long Beach, Calif., Fire Department, died of a heart attack July 13, two days shy of his sixty-third birthday. A widely known and respected authority on fire protection and fire prevention problems, he was former president and a director of the Southern California Fire Chiefs Association and a member of the board of directors of the

Pacific Coast Inter-Mountain Fire Chiefs Association, division of the International Association of Fire Chiefs.

An acknowledged expert in airport fire protection problems, he recently suggested construction of separate airport emergency runways planted with ice plant (a vegetation heavily loaded with water), special hydrant systems and other extinguishing agents.

Born in Scotland, Chief Sandeman joined the department on July 16, 1927; was promoted to captain on April 1, 1935; became drillmaster on September 16, 1945; was named acting battalion chief, July 1, 1945; and was promoted to chief of department on February 19, 1946.

Paul C. Ditzel

Lightning Bolt Speeds And Slows Response

Not long ago lightning struck a residence in Kouts, Ind. Most of the volunteer firemen responded to the resulting minor blaze with greater than usual speed. The bolt also touched off the town fire alarm system. The fire chief was slower than usual, however. He was stunned by the same bolt in his lumber yard near the residence.

George Proper

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SMOKE JUMPERS

Continued from page 785

the older men, with emphasis placed on the latest techniques of fire handling.

Together with the Heli-tack crewman, the helicopter plays a co-starring role. Referred to as the "chopper," it is made available to the Forest Service under verbal agreement between Whirl-Wide Helicopters, Inc. of California, and the Tonto National Forest.

With the choppers available, the first signs of fire are only 10 to 20 minutes away from the waiting Heli-tack crew. The pilot airlifts a two-man team and their equipment, and sets them down in an open area as close to the fire as possible. Unlike other crews, these men are fresh for battle and not worn from a long weary hike to the fire line.

If no open area exists, the chopper moves in close enough for one man to jump into a large bush or small tree that will deflect his fall. The other will then lower the more sensitive equipment, the radio and chain saw. He, too, will then jump, breaking his fall by leaping into brush or trees.

Special jump suits

With their equipment strapped on a metal frame backpack, the men need special jump suits to protect them. This suit is heavily padded and the helmet has a heavy wire mesh guard to protect the face. Complete with heavy gloves, the men are protected from sharp branches, thorns and most cactus. There are very few plants or trees in Arizona that do not have thorns or stickers.

The landed crew will then set about making radio contact with the dispatcher, describe the situation, clean out an area for a heliport and do all the fire suppression work they can until additional fire fighters arrive. Further support is given by the helicopter which carries in tools, food, water and other materials for the fighters on the line. During a recent flurry of fires, most of them started by lightning, the Heli-tack crew was able to contain them with the aid of a water drop. No other fire fighters were necessary.

In the case of small fires, the crew may call for a water or slurry drop. The helicopter only handles water, leaving slurry to larger aircraft. Primary reason for this is that there is no slurry mixing tank available in Payson. Plastic tanks mounted on racks outside the cabin of the chopper will hold up to 75 gallons each.

All slurry drops come from Deer Valley, north of Phoenix, where the

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material is mixed. An adjoining air strip makes it easy for planes to lift the mixtures. All aircraft used in fire fighting, including the helicopters, slurry drops and lead ships, are controlled through the dispatch officer in Phoenix, 91 road miles distant.

Payson has its own volunteer fire department, equipped with two 500-gpm pumpers and a 1,000-gallon foam truck. It is on stand-by service for the Forest Service and it goes without saying that the Heli-tack crew and the Forest Service are on stand-by duty for Payson. Should things get too hot, Kaibab Lumber Co. has a large tanker that is at the disposal of anyone needing it.

Since the fire danger is imminent usually only four to four-and-a-half months of the year, the men of Heli-tack and the chopper are put to other uses common to maintaining a forest. In this manner the financing of the setup is spread out over other facilities utilizing the helicopter. This administrative work helps to defray the cost of the maintenance of the helicopter and the crew to keep it in flying order. The ship, the pilot and the mechanic stay on in Payson on a purely speculative basis, and payment is made only for work performed, which is generally sufficient. □□

CENTRIFUGAL PUMPS

Continued from page 761

requires no choice of whether to operate in pressure or volume. Performance is controlled only by the hand throttle. The single-stage is slightly lighter and less expensive than the two-stage series-parallel for the same capacity.

Two-stage series-parallel pumps arranged for parallel operation only, have been sold as a single-stage pump. They do have two impellers instead of one and two small volutes instead of one large one. They have the higher internal losses characteristic of the two-stage pump. They have given satisfactory performance, with more horsepower required than the true single stage.

Most difficult phase

Several years ago the writer asked a number of large city fire department instructors how they taught pump operators when to switch from series to parallel and vice versa. The usual answer was, "We don't, much as we try. It is the most difficult phase of pumper control to teach the operator."

Continued on next page

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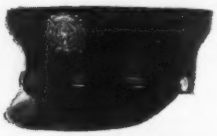
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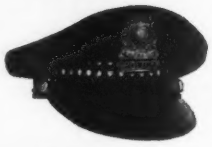
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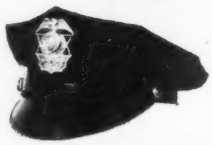
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We have all seen apparatus pumping in series from a hydrant through three relatively short lines, while the nozzle men wondered why they had poor streams. Conversely many of us have seen operators using parallel from draft at high engine speed through one or two long lines requiring 250 psi or more. The single-stage eliminates such mishandling.

Parenthetically, many fire pumps, from 500 to 1,500 gallons, are occasionally abused by pumping at high speed and pressure, with very little water flowing. The water is swirled around at terrific speed within the pump, getting almost nowhere. No wonder it gets hot! It is a bruising process, something like slowly driving a loaded truck down the street by shooting 3-inch artillery shells into the back end of it!

When high pressure at low volume is desired, probably the best solution is the use of a separate power take-off driven pump designed for 600 psi and up, in addition to the major pump. Such a pump may be small, light, and far more efficient than an underwriters pump working under the same conditions. The use of two pumps, one for high pressure and one for the Class A rating, allows each pump to operate within its most efficient design range. Where high pressure, 500 to 800 psi, is desired on a Class A pumper, the single-stage and small high-pressure power-take-off pump meets the requirement without operational abuse to either pump.

Easier to handle

But back to the single or two-stage pumps. The two-stage series-parallel will continue to be popular. It does a good job for the skilled operator, and covers a wider range of pressure than does the single-stage. From the average operator's point of view, the single-stage is easier to handle at the majority of fires, and pumps more water at normal operating pressures.

From small fire companies to our largest cities the use of the single-stage pump on new apparatus is increasing. For two examples; Rochester, N. Y. has five new 1,000-gallon single-stage pumpers. New York City has 20 or more single-stage pumpers, of which the 1,000-gallon pumps, driven by a 275-hp motor, were required to deliver 1,000 gpm at 160 psi; 800 gpm at 200 psi; and 500 gpm at 320 psi.

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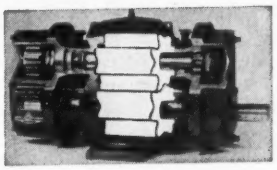

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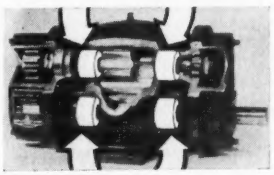

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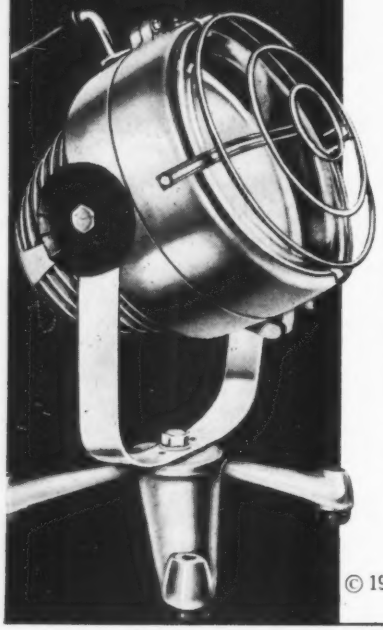

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PHOENIX MEETS THE PROBLEM

Continued from page 751

manpower. It is a fundamental principle that good men must be recruited initially and each must have solid training to develop his full potential.

A fire department growing as rapidly as Phoenix will have a tremendous impact on personnel in all three phases of personnel planning. In recruiting, for instance, where men are examined in relatively large numbers, there is a tendency to look upon recruits in general terms. If the prospects look good generally, then the whole group is assumed to be acceptable. This is a trap to be avoided by any fire department and particularly by the rapidly expanding one.

Recruitment must be on an individual basis. Every man must be individually considered on his own merits and judged critically as to whether or not he might make a good fireman. He must satisfy three questions in the mind of the recruiting officer: Is he physically able? Would I enjoy working with him? Is he officer material?

In this respect, the Phoenix Fire Department found that it could not be lax nor sentimental when hiring new employees. A tight recruitment policy is strictly adhered to in all cases. Minimum standards are established by ordinance under civil service regulations and cannot be abrogated.

Water supply

One major problem encountered by Phoenix was water supply for fire fighting purposes. To better understand the Phoenix situation and the resultant burden on its fire force, some background information is necessary.

In a semiarid locale where average annual rainfall is only 7.16 inches, failure to develop adequate water production facilities can be disastrous. Although Phoenix' water utility in 1957 was placed in Class II by the National Board of Fire Underwriters and is adequate for present purposes, studies have projected its needs to the year 2000. Plans are now under way to begin immediate expansion in accordance with the projected trends.

Of primary interest in the newly annexed areas is the lack of fire mains and hydrants. This situation is compounded in Arizona by what is termed a "tin pipe law." Through authorization of the Arizona State Corporation Commission, private water companies obtain exclusive franchises in fringe areas not served by the city utility. Few regulations are placed on these companies regarding size of mains, and none regarding fire flows or fire

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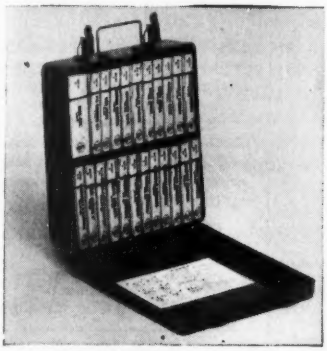

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hydrants. As a result, the minimum-size pipe necessary to furnish domestic supply is generally the rule and proves of little value for fire fighting purposes. Before the city can extend mains of adequate size into these franchised areas, the private utility must be purchased outright. This frequently means months, and in cases of litigation, sometimes years before fire mains and hydrants are provided.

This has forced Phoenix to adopt a semirural fire operation in these areas. Water-carrying tanker-pumpers run on regular assignment with engine companies. Irrigation canals, ditches, laterals and an occasional private swimming pool must be utilized when the tanker supply is not adequate. Extensive use of fog nozzles to conserve water and permit effective fire fighting has become a necessity.

Training is vitally affected by growth. Not only must the pace of training be accelerated to develop effective skills, but necessary provisions have to be made to assure the rapidly expanding fire department of an adequate source of qualified officer candidates to staff its various functions and direct fire operations. This has been effected in Phoenix through the establishment of college-level courses in fire technology, administration and supervision, as well as a continued, special emphasis on daily drills and station classwork. This accelerated training has had the astounding effect of arousing a desire for even more training among the men so that the training officer is hard pressed to satisfy the demands made on his office.

When a fire department doubles, then triples, and continues to grow by some 50 to a hundred new positions a year, there is apt to be a breakdown in organization just from the complexities of supervision alone. With but a few minor changes, the Phoenix Fire Department is operating under the same command structure it had in 1940. Studies were begun early in 1960 to determine areas of weakness and the best solutions to effect changes which would be desirable for present operations and at the same time be flexible enough to assure the future years of a good, sound management structure. These studies have been firmed up at the present time and have been presented to the governing body of the city as part of the department budget for the coming fiscal year.

Communications

Fire alarm communications are generally a bugaboo in the large-scale annexation picture. This is particularly true where the use of underground cable is concerned. It is almost

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an impossibility for the average fire department to immediately install its own cable. As a result, Phoenix has made extensive use of leased cable from the local telephone company. This has proven relatively satisfactory as an alternative measure and has not adversely affected the grading of the fire alarm system.

Extensive use has also been made of new innovations of the electronic age. Experiments have been made with microwave and various electronically operated devices which seemed applicable to the receipt and transmission of fire alarms. As a result, the gong alerting system, as well as tape register, has disappeared from stationhouses. Replacing them is a "selective call" system where only the affected units are alerted. Dual recorders keep a permanent record of all vocal receipts and transmissions of alarms, as well as of two-way radio transmissions. Telegraph boxes are maintained in the high-value area only. Pending a favorable ruling by the Federal Communications Commission is a proposed microwave system which will broaden present facilities by the addition of interstation voice circuits, teletype and even fire alarm boxes.

Rapid growth is not an enviable experience for any fire department. To keep apace with it sometimes demands bold imaginative measures on the part of its fire officers. At the same time strict demands are made on their decisions that they conform to the accepted basic principles of the profession. In addition, a wary eye must at all times be focused upon public responsibility and the wise spending of each tax dollar. It is an experience that will either lend stature or, by sheer weight, pull an organization down to a rubble of mismanagement and chaos.

It is not by accident that the Phoenix Fire Department is looking ahead with eager anticipation to the coming years. Effective planning is the secret. Through this, Phoenix hopes to prove that because of its tremendous growth through annexation, it is no longer a "cow-town outfit" but one of the nation's first-class, progressive fire departments. □□

Hudson Valley Firemen Honor Colonel Ellsworth

Officers and members of the Hudson Valley Volunteer Firemen's Association, meeting in Hudson Falls, N. Y., climaxed the 72nd annual convention by memorial services for Colonel Elmer Ellsworth, first commander of the 11th New York Infantry during the Civil War. The service was held at his grave in River View Cemetery, Mechanicville, N. Y.

Colonel Ellsworth organized the first northern volunteer regiment inducted during the Civil War from 1,100 New York City firemen. He was a West Pointer and the only man in the "Fire Zouaves" as they were known, who was not a fireman. He was the first northern officer killed during the conflict when the regiment occupied Alexandria, Va.

Charles M. Fales

FIRE PROTECTION CURRICULUM

Continued from page 789

organizations where they serve as fire protection specialists, fire marshals, or safety supervisors. The remaining 10 per cent are employed by governmental agencies as fire protection technicians, fire marshal's representatives, or as fire service field instructors. A few are employed in fire equipment sales.

The past few years have produced many technological advancements in the various fields of science and industry and, in many cases, unfamiliar materials and processes have resulted in new and greater fire hazards. In an effort to keep pace with recent trends in insurance and industry, a questionnaire was sent to all graduates of the fire protection course requesting suggestions for changes in curriculum. Suggestions were also solicited from many of the organizations that employ the graduates. After all were tabulated, the new curriculum was developed following the recommendations of the graduates and their employers.

Curriculum

The revised curriculum was developed for high school graduates or equivalent and gives the student an organized background of academic subjects including English, chemistry, mathematics, physics, history, and related academic subjects, such as industrial safety, drafting, insurance and public speaking. The academic subjects are supplemented by specialized fire protection subjects which include principles of fire protection; fire hazards—both general and industrial; inspections; hydraulics; extinguishing and alarm equipment; fire codes and standards; and water supply analysis. The course can be completed in two years and graduates are awarded an associate degree in fire protection technology. □□

Revised Fire Protection Technology Curriculum

			T	L	C
		Semester I			
Tec	131	Personal & Occupational Guidance	1	0	1
Tec A	102	Fire Extinguishing & Alarm Systems	1	3	2
Tec A	112	Fire Hazards & Clauses	1	3	2
Tec A	132	Principles of Fire Inspection	1	3	2
Tec	113	Tech Drafting	1	6	3
Chem	114	General Chemistry	2	4	4
Math	173	College Algebra	3	0	3
Total Semester Hours Credit					17
		Semester II			
Engl	115	Composition	5	0	5
Chem	124	General Chemistry	2	4	4
Math	183	Trigonometry	3	0	3
Tec A	122	Fire Protection	1	3	2
Tec A	162	Fire Codes & Standards	1	3	2
Tec A	182	Industrial Fire Hazards	1	3	2
Total Semester Hours Credit					18
		Semester III			
Physcs	114	Mechanics, Heat, Sound	3	3	4
GenBus	303	General Insurance	3	0	3
Spch	102	Public Speaking	2	0	2
SocSc	114	Challenges in American Democratic Life	4	0	4
Tec A	272	Fire Protection Hydraulics	1	3	2
Tec A	242	Automatic Sprinklers	1	3	2
Total Semester Hours Credit					17
		Semester IV			
Physcs	124	Electricity & Light	3	3	4
Chem	263	Organic Chemistry	2	3	3
Gen Bus	353	Fire & Marine Insurance	3	0	3
IndEn	332	Industrial Safety Engineering	2	0	2
Tec	242	American Industrial Development	2	0	2
Tec A	232	Fire Inspection Practices	1	3	2
Tec A	292	Water Supply Analysis	1	3	2
Total Semester Hours Credit					18

T = Theory Hours per Week
L = Laboratory Hours per Week
C = Semester Hours Credit

GROWING PAINS

Continued from page 743

tion will add 26 square miles to the southwest area of the city, and additional stations for this area are being planned for at the present time.

In regard to fire districts, annexations often cause them difficulties. In fact, Jerome M. Kornfeld, chairman of the Law Committee of the New York State District Officers Association, told the 87th annual conference of the International Association of Fire Chiefs at Rochester, N. Y., last year, that within recent years annexations of portions of fire districts by adjoining communities has been steadily growing as the No. 1 problem facing the fire districts. "The adjoining community, the village, for example, decides to expand its boundaries. The fire district is a likely place for this expansion, and the (district) commissioners find one morning that a goodly portion of their fire district has been annexed to a village," he said. Involved are fire tax rates and district bonds.

Mr. Kornfeld expressed the belief that the question of whether an annexation will benefit both the city and the area to be annexed is not the sole question to be asked, but rather, will the annexation affect, in a detrimental manner, the area from which it comes, namely the special district, should there be one in existence? □□

ELECTRICAL HAZARDS

Continued from page 765

touch the vehicle or person under it. The heat of shorted wires could cause the same wire to burn a long distance from the actual trouble. Wires lying on the ground can be whipped all the way across a street by a tie wire releasing and slack going back into a tightly sagged span, or a vehicle might hit the conductor several spans back were there might be some slack in the wire. A wire could burn in two while it is lying on the ground and curl up and roll along the ground.

Eye injuries can result from electric arcs. Do not look at the flashes of an electric arc. This is the same arc used in electric welding.

(*To be continued*)

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Sealed bids for the sale of (1) 1946 Chevrolet, 500 gallon per minute triple combination pumper with equipment, including radio, will be received at the office of the Clerk of the Village of Downers Grove, Du Page County, Illinois, until 8:00 o'clock P.M., (C.D.S.T.) September 25, 1961 and at that time publicly opened and read. Fire engine can be seen at Fire Station #1-1120 Warren Avenue, Downers Grove, Illinois.

The Council reserves the right to reject any or all bids and to waive technicalities.

By order of the Council of the Village of Downers Grove, Illinois dated July 10, 1961.

Laura S. Geffert
Village Clerk

Published in the Fire Engineering, September 1, 1961.

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Yours for the asking. Send post card today requesting Folder F showing complete line of belt buckles with your name, initials, latest Fire Engines, Pumpers, Hook and Ladder, Rescue Wagons, Salvage Trucks and other Firemen enameled emblems which are also available on Tie clasps, Lapels, Money clips, Cuff Links, and Key Chains. Write:

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SAFEGUARDING SCHOOLS

Continued from page 847

seconds, it was at no time a dangerous fire to occupants of the building."

A fourth series of tests consisted of 26 fires which studied the behavior of ceilings finished with acoustic materials and wood, and compared the results with "tunnel test" results.

"Acoustic tile rated from 3 to 92 in the 'tunnel test' was exposed to wood crib fires varying from 75 pounds to 340 pounds. In no case did the fire propagate down the length of the corridor. The flames spread and char pattern showed a usable correlation with the tunnel test ratings."

Three fires set

Three fires involving red oak tongue-and-groove floorings were set to establish base criteria (flame-spread rating: 100). "The fire did not propagate the full length of the corridor with the red oak, except when a 500-pound crib was used as the exposing fire.

"One fire was conducted with 'pecky' cedar plywood using a wood crib of 367 pounds. The flame did not propagate the full length of the corridor, but did propagate further than the red oak ceiling using the same size exposing fire."

Of special interest was one fire involving a Douglas fir plywood ceiling with a flame-spread rating of 125-145, using a wood crib of 367 pounds.

"The flame propagated the entire length of the corridor and after 5 minutes, 30 seconds, the plywood delaminated over the exposing fire. The additional burning surfaces due to the delamination of the plywood increased the heat release to such an extent that it was necessary to exinguish the fire immediately."

The effect of fire upon plastic light diffusers and plastic windows was studied in six test fires. Both fire-resistant and nonfire-resistant types of acrylic plastic panels were used as light diffusers. While the resin dropped out of the light fixture under flame exposure, the acrylic did not contribute any fuel or smoke to the fire.

"Polyester resin plastic panels (Fiberglass-reinforced) used for window glazing," said the report, "ignited under flame exposure and continued to burn with release of quantities of black smoke." The report notes, however, that the plastic window panels ignited only when exposed to direct flame impingement. When the plastic material was burning, there was a release of dense black smoke in exceptional quantities.

"These tests indicated that this material should be used only in classrooms with definite limitations on the total area of plastic material used within a given room, a limitation on the vertical dimension of individual areas of material, and by providing proper separation between adjacent areas.

"When a small window panel 22 feet square in size was burned, the quantities of smoke were not objectionable. However, when a window 115 square feet in size was burned, the quantities of smoke were objectionable.

"When the room was equipped with automatic sprinklers (but no water in the line) the sprinklers operated before ignition of the windowpane."

A sixth series of tests consisted of five fires set to study smoke and heat patterns throughout the school and to compare them with similar fires set in the 1959 series Smoke and heat travel was found to be comparable.

Sprinkler systems

Two fires were set in another series to study the operation of partial sprinkler systems.

"Automatic sprinklers installed in corridors, stairways, and some rooms, but not throughout the building, did not prevent untenable smoke conditions throughout the building when fire originated outside the sprinklered area. The sprinklers, however, prevented untenable temperature conditions except at local areas close to the test fire."

The report observes, "An automatic sprinkler installation involving other than complete coverage may afford a measure of protection when installed in areas most subject to fires and connected to the school fire alarm system. Such an installation will not prevent smoke spread when fires originate outside the sprinklered area, but can prevent untenable temperature conditions within the area protected.

"When fire originates outside the sprinklered area, smoke and heat will build up and by the time heat reaches the sprinklered area and operates a sprinkler, untenable conditions involving smoke and heat can exist when sprinklers are operating; the fire, being inaccessible to control by the sprinklers, will continue to produce heat and smoke."

In the final series, a single fire set to compare operating times of smoke and heat-actuated door-closing devices found that closers actuated by smoke and rate-of-rise detection devices operated significantly faster than devices employing fusible links rated 135° F. and 165° F.

The report makes a special point of emphasizing that steam generation was not a problem in any of the test fires involving automatic sprinklers. Referring to a 1959 test report statement which "many persons interpreted . . . to imply that students could be scalded by the operation of automatic sprinklers in a fire, " the new report says, "This is completely untrue."

In a concluding section, "Why Untenable Smoke Conditions Constitute the Principal Hazard," the report refers to the rapid build-up of untenable conditions in open stairway, multistoried schools.

"Because an automatic sprinkler head is inherently slower in operation than the automatic fire detection devices used in these tests, one may wonder why the automatic sprinklers were successful in preventing dangerous fire conditions, while by contrast, some fires were not detected in sufficient time to safely evacuate the building."

The tests show that automatic fire detection devices operate before the sprinkler head.

"However," points out the report, "during the three minutes necessary to evacuate the school building (the three-story St. Agnes School) the fire continues to burn and, in fact, burns at a rapid rate. If, during this three-minute time interval, untenable smoke or temperature conditions occur, the detection device has 'failed' as far as this particular fire in this particular building is concerned.

"By contrast, when the automatic sprinkler head operates (at a time after the automatic fire detection device), it immediately serves to 'knock down' and extinguish the fire. The automatic sprinkler then serves to stop the growth of the fire and thus prevents the development of untenable smoke or temperature conditions within the building."

The second school fire report is certain to be discussed and debated among fire officers, equipment makers, and those interested in school fire safety. In the final analysis, however, it is up to the individual chief to evaluate the report and to apply the findings contained in it to the peculiar conditions existing among schools for which he is responsible. □□

Take Fire to Water

Central City, Colo., firemen recently responded to a fire in the transformer house at the Glory Hole mine. A quick size-up indicated the water in the pumper's booster tank wouldn't be sufficient to extinguish the blaze, so the firemen dragged the burning building into a nearby creek.

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Like so many Officers and Directors of the International A'ssn. of Fire Chiefs, past and present, Chief Lew Marshall is a long-time Circul-Air user. Lew says, "We have Circul-Aired our hose for over 10 years and found these Dryers do a highly satisfactory job. They are trouble-free, too,— none of our 6 Dryers has ever required replacement parts or servicing of any kind. Our good neighbors at East Providence, North Providence, Woonsocket, Pawtucket use your equipment, too, as do most of the more modern departments in the New England Division."

Chief Lewis A. Marshall
Vice-President, I.A.F.C.
Providence, R. I.

OVER 6000 Fire Departments CIRCUL-AIR Their Hose

The ORIGINAL Electric Hose Dryer

- Eliminates Ugly Unsafe Hose Towers
- Dries Hose In a Few Hours
- No Radiant Heat — Can't Injure Hose
- Dries Fire Clothing, Too
- Keeps All Hose Ready for Service
- Reduces Station Construction Cost

Roto-Jet

"Automatic" FIRE HOSE WASHER

WASHES • RINSES • DRAINS

- Hose is Self-propelled • One-man Operation
- Washes Uniformly — Including Edges
- Uses Clear Water or Detergents
- Drains Hose Linings, Too • Portable

Porto-RAK

MOBILE HOSE STORAGE AND LOADING UNIT

- Racks 1800 ft. 2½" Hose
- Equipped with Locking Casters
- Detachable Turn-table to Re-load Truck
- Stores in a 9 ft. Space
- Moderately Priced — Shipments from Stock

SA APPROVED UL

THE CIRCUL-AIR CORPORATION 575 EAST MILWAUKEE DETROIT 2, MICHIGAN

Write for **COMPLETE DETAILS**

AN ANNOUNCEMENT OF IMPORTANCE TO PROGRESSIVE FIRE CHIEFS

Akron Brass will introduce at the I.A.F.C. Convention in Las Vegas, a new line of wyes, siamese, and valves.

We believe this is an event of real importance to the fire service for the following reasons.

1. All valves will be full flow, ball valves. This means that wherever you have a 2-1/2" valve it will have a full 2-1/2" passage through the ball.

2. The material used will be "Pyrolite."* This means greater strength, no corrosion, one-third the weight.

3. Last and most important — all valves will have the new "TORK-LOK"* control. "TORK-LOK"* gets rid of locks on handles forever. It gives the operator full control of the water stream. Set your handle in any position — it will stay there, until you change it. No more will water pressure or vibration slam your ball valve open or shut when you choke a stream. You have to see "TORK-LOK"* to believe it. Your handle will turn easily — but only when you turn it.

These are the new features. In addition, all items in the "Pyrolite"* line will operate freely at 500 pounds pressure, will hold 1,000 pounds pressure, have fixed balls, flanged construction and adjustable seals.

We believe this is the finest equipment ever offered to the fire service. We cordially invite you to see for yourself at the Akron Brass exhibit in Las Vegas.

Sincerely,

Ray J. Kubec, President
Akron Mfg. (Canada) Ltd.

J. E. Fishelson, President
Akron Brass Mfg. Company, Inc.

*"TORK-LOK" and "Pyrolite" trademarks and patents applied for.

Initial items to be offered in the "Pyrolite"* line, with "TORK-LOK"* controls are:

2-1/2" x 1-1/2" x 1-1/2" Ball Valve Wyes

2-1/2" to 6" x 2-1/2" x 2-1/2" Ball Valve Hydrant Wyes and Siamese

2-1/2" x 1-1/2" x 2-1/2" x 1-1/2" Water Thief

All Akron Brass items using ball valves 1-1/2" or larger, and all Akron valves 1-1/2" or larger, will have the "TORK-LOK"* control.

AKRON BRASS MFG. CO., INC.
WOOSTER, OHIO

AKRON BRASS
FIRE FIGHTING EQUIPMENT

AKRON MFG. (CANADA) LTD.
AYLMER, ONTARIO